Mr. and Mrs. James
D. Hurd

50TH ANNIVERSARY

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March 24, 1687.

ARTS TREASURY:

OR, A

Profitable and pleasing Invitation to the Lovers of

INGENUITY.

Contained in many extraordinary Experiments, Rareties, and curious Inventions.

In two PARTS.

PART I. Containing the Mystery of Dying Cloths, Silks Stuffs, Hair, Feather, Bone, Horn, Ivory, Leather, *&c.* The manner of preparing Colours, Directions to take out Spots, Stains, Pitch, Tar, Wax, Rosins, *&c.* out of Silks, Stuffs, Woollen, Linen, *&c.* To recover faded Colours and preserve Apparel, *&c.* To scowr Silver and Gold Lace, Plate, *&c.* Preparing Cement for glass, China, *&c.* Diapering Linen, making Perfumes. The Art of Drawing, Limning, Painting, preparing and laying on Colours, Etching, Engraving, Curing, Gilding, Enammelling, refreshing Pictures, hangings, Carpets, preparing Flock-work-cloth, directions to paint thereon, and to make sundry Colours; prepare Gums, Alum-Water. The Art of thickening Linen, Washing or Colouring Maps, or printed Pictures, with sundry other things, *&c.*

PART II. Containing the Quality, Generation and Product of Metals and Minerals, Natural and Artificial, directions to harden or soften them for use. The Art of Souldering, Burnishing, and Gilding Metals Instructions for making Inks of all kinds and Colours, preparing Gold or Silver for Writing, and all manner of Sealing-wax, Wafers, *&c.* Gold and Silver to know the fineness, and to detect counterfeit Coins. How to write sundry ways, that it shall not appear without the help of Fire, Water, *&c.* taking blots and writing off Paper or Parchment. The Mystery of beautifying, writing with Gold or Silver, Colouring, Dressing, Cleansing, and Perfuming Gloves, Ribands, *&c.* Imbossing in Plate, Wax-work, Imagery, Dyalling, Gauging, Washing Point-lace, Tiffany, Sarcenet, Lutestring, and any coloured Silks, *&c.* Weighing Ships, extinguishing Fire, blowing up Houses or Vessels under Water, *&c.*

London: Printed for *W. Whitwood*, next the Bible in *Duck-Lane*; and Mrs. *Feltham* in *Westminster-Hall.* 1688.

(P[illegible])

THE PREFACE TO THE READER.

READER,

HAving well weighed and considered, That a Book containing ſundry Varieties of this Nature, might prove exceeding uſeful; I held it highly neceſſary for the Advantage of the Induſtrious part of Mankind, as well for the increaſe of Profit as Pleaſure, beſides my own Experience to conſult the beſt Authors

and greateſt Maſters, moſt approved in all Ages for their Skill and Dexterity in what I have adventured to lay down; and from their worthy Labours have extracted even the quinteſſential part of what their many years Study and Practice had brought to perfection; and not only ſo, but rendred that which ſeemed hard, and to many unintelligible, plain and eaſie to be underſtood and practiſed, adding a great number of New Receipts and Curious Matters, never before made publick: So that all things rightly conſidered, I may juſtly term this Book, though ſmall in it ſelf, yet exceeding Copious and Elaborate in what it comprehends

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bends and contains, The Store-house or Treasury of Art, *&c. nothing being omitted that in the least I conceived pertinent or conducing to the Illustration or Advantage of a Subject woven with so many Golden Threads of Variety, to render it the better acceptable and more grateful to the Sons of Art, and all Lovers of Ingenuity; which may over and above prove as a friendly* Guide *and* Instructor *even to the unskilful in these Affairs, and lead them as it were by the hand to the Knowledge of Things and Matters worthy their best and more serious Considerations; the which that it may do and prove universally Beneficial and*

Use-

The Preface.

Useful, as the various Subjects it candidly, experimentally, and Impartially Treats of, is the hearty wish of,

Reader,

Your Friend, and

Very Humble Servant,

John White.

Seve-

Several BOOKS *lately Printed for* W. Whitwood, *next to the Bible in* Duck-lane.

1. M. *Funiani Fuſtini ex Trogi Pompeii Hiſtoriis Externis Libri* 44. *Omnia quam diligentiſſime ex Variorum Exemplarium Collatione Recenſita & Caſtigata in uſum Scholaſticæ Juventutis, cum Vita ejus ex Gerardi Johan. Voſſii.* Price One ſhilling. This Book is now carefully Corrected, with Notes, by a *London*-School-maſter.

2. The Wars of *Hungary*, ſince it was firſt invaded by the *Turks*, to this time, *viz.* The Relief of *Vienna*, the Taking of *Newheuſel*, *Gran*, *Buda*, with the memorable overthrow of the *Turks* on the River *Drave*, the Taking of *Eſſeck*, and the ſucceſs of the Chriſtian Arms to this preſent year 1688.

3. A Collection of Apophthegms or Sayings of the Ancients, out of *Plutarch*, *Diogenes Laertius*, *Elian*, *Eraſmus*, and others; wherein the Manners and Cuſtoms of the *Grecians*, *Romans*, and *Lacedæmonians*, are repreſented.

4. The *Spaniſh* Hiſtory or Relation of the difference between Don *John* of *Auſtria*, and Cardinal *Nitard*, are repreſented, with Letters and Politick Diſcourſes between Perſons of the higheſt Quality, relating to that Affair.

5. *Ovid's* Heroical Epiſtles, Engliſhed by W.

W. S. and illustrated with twenty four Pictures curiously Engraven on Copper Plates.

6. An exact Survey of the Grand Affairs of *France* since the Treaty at *Nimiguen*; but more especially what relates to Count *Teckely* and the *Hungarian* Wars.

7. The Curiosities of Scurvy-Grass, in which is exhibited to publick Use the Preparations of Medicines, both Galenical and Chymical, either for Internal or External use, in which that Plant or any part thereof is employed; with Figures of all the sorts of Scurvy-Grass: By Dr. *Sherley*.

8. Reflections upon Ancient and Modern Philosophy, Treating of the *Egyptians*, *Arabians*, *Græcians*, &c. in French, by the famous Monsieur *Rapin*; Englished by Mr. *Lovell*.

9. The Illustrious Lovers, or Princely Adventures in the Courts of *England* and *France*, a Novel.

10. The Lives and Actions of several notorious Counterfeits, who from the most abject of the People, have Usurped the Titles of Emperours, Kings, and Soveraign Princes; in Twelve several Histories.

11. *M. Jumani Justini ex Trogi Pompeii Historiis Externis Libri 44. Cum Notis Vossii Thysii Bongarsii.* Price Two Shillings.

12. The Fortunate, Deceived, and Unfortunate Lovers; three excellent new Novels, containing many pleasant and delightful Histories.

13. The Worthies of *England* in Church and State,

State, illuſtrated in the Lives and Characters of the moſt Eminent Perſons ſince the Conqueſt, being an Epitome of Dr. *Fuller*.

14. A Phyloſophical Eſſay, declaring the probable Cauſes whence Stones are produced in the Greater World; from which is taken occaſion to ſearch into the Origin of all Bodies, diſcovering them to proceed from Water and Seeds; by Dr. *Sherley*.

15. The preſent State of *Geneva*, with a Deſcription of that City, and the ſeveral Changes and Alterations it hath been ſubject to, from the firſt Foundation thereof, to this time.

16. Curious Obſervations in that difficult part of Chyrurgery relating to the Teeth; an account of their Cauſe, of Corruption, and Putrefaction, with proper Remedies: Conſiderations on the Tooth-ach, looſneſs of the Teeth, the uſe of the Polican or Inſtrument with which they are drawn on all occaſions.

17. A Treatiſe of Lithotomy, or of the Extracting the Stone out of the Bladder; wherein an Account is given of the various Inſtruments uſed, and the Method obſerved in that curious but difficult part of Chyrurgery; illuſtrated with twenty Figures, curiouſly engraved on Copper-Plates.

18. The Hiſtory of the damnable Life and deſerved Death of Dr. *John Fauſtus*, the famous Conjurer of *Germany*; newly Printed from the Correct Copy from *Franckfort* in *Germany*.

19.

19. The History of *Justin*, Translated out of the Four and Forty Books of *Trogus Pompeius*; Containing the Affairs of all Ages and Countries, both in Peace and War, from the beginning of the World, to the Time of the *Roman* Emperours; now Reprinted, with the Life of *Justin*, and the time when he flourished; by *Gerard John Vossius*; Englished by *Rob. Codrington*, Master of Arts.

PLAYS.

The Elder Brother.
The Reformation.
Pastor fido.
Flora's Vagaries.
Mock-Tempest.
Unfortunate Mother.
Charles the Eight King of *France.*
The Revenge or Match at *Newgate.*
Herod and *Mariamne.*
Piso's Conspiracy.
Imperiale.
Settle's Notes on *Dryden's* Plays.

Art's Treasury, or a profitable and pleasing Invitation to the Lovers of Ingenuity, contained in many extraordinary Experiments, Rarieties, new, and curious Inventions, &c.

PART I.

CHAP. I.

The Art and Mystery of dying Silks, Stuffs, cloth, feathers, &c. *In the most curious and delightful Colours, with the manner of ordering, making and preparing them,* &c.

SO pleasing to the Eyes of mankind, are the various colours that we daily or frequently behold, that they in a manner captivate and detain even the fancy it self with Wonder and Delight. Wherefore, I have thought it highly convenient, amongst the many

ſtupendious Secrets and Curioſities this Book contains, as well tending to profit, as pleaſure, if duly practiſed, to place the Art of colouring, vulgarly called dying, in the beginning, as an Introduction to the reſt, it being much wanted, and frequently coveted by publick and private Perſons, to be known, and rightly managed. Wherefore for its better Improvement, take the following Rules and Directions.

To colour or dye Wool, or Woollen Cloth a curious red.

Take a conſiderable quantity of Alum, and diſſolve it in Water, wherein bran has been boiled and ſtrained out, putting the Cloth, Wool, or Yarn, to ſteep in it, which being well ſteeped, put it into other clear water, heating it over a gentle fire, putting thereto greening-Weed, two pounds, to four gallons of water, ſtirring it about; but not ſuffering it to boil; add more, a handful of unſlaked Lime, and as much Wood-Aſhes, ſtirring about the materials, adding yet a like quantity of Lime, Aſhes, and a pound of the Powder of Log-Wood, or red-Wood, and the like of Braziel, and ſo in three or four hours time, a very fair colour to your ſatisfaction will be taken.

To dye Linen Thread, or Cloth red, &c.

Take a pound of Sam-fleure; and ſuffer it, for the ſpace of twenty four hours, to ſoak in two Gallons of water, heating over a gentle fire; then add, half a pound of the powder of Braziel, two Ounces of Vermilion, and an Ounce of Alum, diſſolved in a pint of fair water.

To dye a clear, or pleaſant light Red.

Take Wheat Bran, half a Peck, two Ounces of Alum, and boil them in four gallons of fair water, then through a fine hair ſieve, ſtrain out the liquid part, then diſſolve in it half a pound of Alum, and the like quantiy of white Tartar, and put in the Stuff, Cloth, &c. intended for colouring, adding three pound of Madder, and perfect the colour at a moderate heat without boiling.

To dye Silk a Sanguine Colour.

Take a pound of Alum, and two pound of Greening weed, bruiſe them well, and pour upon them fair water, add then half a pound of Ground-Braziel, heat them over the Fire, and put the ſilk in ſome part of the liquid matter, ſuffering it to ſeeth therein, and ſo renew it with the remainder, till you find your Colour take, and having ſo done three times, rinſe it in Lee

of Oak-bark, or Wood aſhes, and afterward in Water.

To dye a fair Blue.

Take white Silk, Stuff or Cloth that is white, and ſoak it in water, then having wrung the water out, add two pound of Woold or Woad, a pound of Indico, and three ounces of Alum, and then gently heat and diſſolve them in the water, and ſo dip your materials, till you perceive the Colour has taken.

To dye a purple Colour.

Take the Silk, Stuff or Cloth, that has alread; taken a blue, and dip it in Braziel and Alum-water, at moderate heats; and you will ſoon perceive your Colour anſwer your Expectation.

To dye Carnation.

Take a dry purper, and ſoak it a night in Man's Urine; then take your Cloth, that has been ſoaked in Alum-water, and dryed again, and put it therein, ſuffer the purper before hand to be twice ſeethed in fair water; then ſet another Veſſel by the Fire, and ſuffer the Cloth to take the dye therein.

To dye a deep red Carnation.

Take Linen and woollen white, Gall, and Alum it well, and take the herb call'd by the *Dutch* Foli, which is to be found on the banks of Ditches, to the quantity of a pound well dryed; *Indian* Lake, four ounces, *Spaniſh* red, two ounces; make of theſe and Alum-water a hot Liquor, and dip your materials therein, at gentle heats three or four times; and it will afford a curious Colour.

To dye ſilk Quoins a curious red.

Steep firſt your Silk in Alum-water, giving it a gentle heat, adding thereto in the heating, Bran-water; then take a pound and a half of greening weed, and ſo heat it up, and put the Silk therein, but let it not ſeeth, then take it out and rinſe it in Ley, and after that in water, adding ſome Powder of Log-wood; and ſo heating it up a ſecond time, the buſineſs will be perfected.

To dye a fair yellow.

Take the Stalks, Leaves and Seeds, *&c.* of Wood, the roots being cut off, and lay them in ſoak in Ley of wood Aſhes, for the ſpace of three hours, after that ſeeth them, till you think they are ſufficiently ſodden; then put them into hot water and Urine, and heat them up in-

different well straining the liquid part through a sieve, adding to every two pounds of woad, two pounds of Verdigrease, with the Ley already sod, stirring and well mixing it together in your Liquor, for the space of three hours, and so dip into it very hot at three or four times what you intend to colour.

Another way to dye a curious Purple, viz.

In case, it be silk you intend to dye, you must to one pound of it take four ounces of Alum and a gallon of water, dissolving the Alum therein o'er a gentle Fire; putting then the Silk therein, and suffering it to lie, for the space of four hours; then take of *Indian* Lake and Indico, each a quarter of a pound, add likewise a quart of Urine, and so heat them up into a dye, adding more about a handful of Cochinele.

A curious green water to make.

Take half an ounce of Verdigrease, bruise it well, put thereto the yolk of an Egg, and a few blades of Saffron; then take of the Leaves of Spurge half a handful, bruise them with a quarter of a pint of Vinegar, straining the liquid part through a cloth, and mingle it with the materials before mentioned, so thin that it may take either in dying or painting.

To make a black water to dye Silk Cloth, &c.

Take half a pound of Nut-galls, add to them a pottle of water, and an ounce of Lamb-black, with a handful of the ruſt or filings of Iron, heat them up, adding half a pound of coperas, ſeeth them to a half Conſumption, adding then a pint of Gum-water, and ſo ſet it by for your uſe, *&c.* and it will prove excellent good, the longer it is kept, it being the better.

To dye Linen or Silk a Roſe red.

Take to every four yards and a half, a pound of Nut-galls, and ſeeth them in fair water unbruſed, for the ſpace of two hours, when pouring out the liquid part into another Veſſel or Pan, put your Linen, *&c.* into it, and ſuffer it to ſoak for the ſpace of four hours; then wring it dry, and heat it again in Alum and fair water, adding half a pound of Braziel powder, and a pound of Greening-weed, and ſo by gentle heats make up your colour to the heighth.

To dye a fair green.

Take Bran-water and Alum, a Gallon of the former, to a pound of the latter, and ſeeth them up, till the Alum is diſſolved; then for about a quarter of an hour, let your Silk or Cloth lie therein; then take more Bran-water and a few

handfuls of woad, and put it therein, till it become a dark yellow; then add Verdigreaſe and Indico of each half a pound or more, or leſs of the one or the other, as you would have it lighter or darker.

To dye a good black.

Take two pounds of Galls, and half a pound of Coperas, ſeeth them in water over a gentle Fire, putting your Silk, Stuff or Cloth therein, and ſtirring it about; then hang it to dry, and prepare your dye in this manner, *viz.* Take a large Fatt, and put therein three or four handfuls of Rye Meal, and half ſo much of ſwarf of the Grind-ſtone or Smiths water, with two handfulls of elder bark, and the like quantity of the ruſt of Iron, and having ſuffered it to ſtand for the ſpace of three days, heat it up and put your materials therein, *&c.*

To make a thick water to work on yellow Silk the beſt way.

Take two quarts of the beſt Varniſh, add to it an ounce of the Flower of Sulphur, half an ounce of Camphire; then ſeeth it a while, and ſuffer it to cool, ſtraining it through a Cloth, to take away the groſſer part; and when you uſe it, let it be mixed with a ſmall quantity of Gum-Arabick water.

To make a curious red Water.

Take two quarts of fair water, four ounces of Gum-Arabick, a pound of faucet Woad, ſeeth them together, till half be conſumed; and then taking it off, put into the remainder half an ounce of *Spaniſh* green, and about thirty grains of Cochinele, and ſo uſe it as you ſee convenient.

To make a curious blue Water for Silks, Stuffs, or Woollen.

Take three parts of Soap-boilers Aſhes, and one part of unquenched Lime, make of them a Ley, and ſuffer it well to ſettle, then add to the thinner part taken off, a pound of Bolo-emen, ſtirring them well together over a gentle fire, adding a pound of Woad, and half a pound of Indico, dipping what you intend to colour therein when it is very hot.

To work on yellow Silk, white, grey, or Azure Colour.

Take a pottle of fair water, and a fourth part of Gum-Arabick, and half a pottle of faucet Woad, an ounce of Arſnick, and the like quantity of Turmerick ground ſmall, and ſeeth them over a gentle Fire, putting a ſmall quantity of Grains therein, and ſo apply it to your uſe, as you ſee convenient.

To make a red Water for white Silk or Wool, green, yellow, Violet or Azure.

Take two quarts of running water, and an ounce of Braziel, heat them up till half be consumed; then take it off the Fire, and put in an ounce of Grains, and a quarter of an ounce of Gum Arabick, with a quarter of a pound of Alum Powder, and suffering it to stand all night, in the Morning you may use it.

To make grey Florey.

Take Florey, and soak it twenty four hours, at the end of which, wring it through a Cloth; then take the Ashes of the Vine, and make a Ley with them, and spread the Florey for the space of two hours upon a Table, and having put the Ley into three Vessels, take the Florey, and put it into one of the said Vessels, and so shift it to the rest, putting before you dip your Linen, &c. Vinegar to it, and your Colour will be good.

To dye Linen with Crampmede.

Use in this a pound of Crampmede, to three Ells of Linen, and put it to a gallon and a half of water, or so proportionable to the quantity, and warm it over the Fire, till it appears ready to seeth; then add to it two ounces of Galls, and so put your Linen into it, and as often as you take

take it out, which must be frequent, wring it, when having a pot of fair water ready heated with Alum dissolved in it, put the Linen well wrung into it; and so rub it over at the taking out, and dry it; but if you would have it the darker Colour; then is it requisite to have a Ley made with Lime-Stones, or unslaked Chalk, &c.

To dye Velvet, or other things requiring it, the most curious of Blacks.

Take of Galls two pound, Coperas half a pound, Smiths water a Gallon, the powder of burnt Ivory an ounce, and of Oak bark, and Shooe-makers black ground to powder, the like quantity, and two gallons of fair water, mix them well together, and suffer them to stand in the Sun or some other warm place for the space of thirty days, with often stirring about; then put your materials therein, and as often as you dip, hang them to dry, and your expectation will be answered.

To make Bran-water much used in dying, &c.

Take half a peck of Wheat Bran, and two gallons of fair water, set them on the Fire, giving them a gentle heat, which being done, put half a pound of Alum powder into it, and suffer it to stand a week or more, with sometimes stirring it about before you use it.

To dye Wooll or woollen Yarn.

Take four pound of Wooll or yarn, two pound of Woad, putting the Woad into a Kettle to two gallons of water; then throw in two handfuls of Wood-Athes, and when it seetheth, put your Wool or Yarn into it, and let it remain there about half an hour, at what time take it out and wring it and put it in again, and let it seeth as long as before; and then if it be before a brown blue, it will be a dark green, or if it was white, it will be a yellowish colour. And thus much at present, in relation to Colours for dying Silks, cloth, &c.

CHAP. II.

The most curious Art and Method of colouring Skins, or any peices or parcels of Leather or Bristles; as also of gilding Leather with Gold, laying with Silver or Lacquering, &c.

To colour Skins green.

TAke the Leaves of Night-shade, bruise them in a Mortar, strain out the juice, and dissolve in a pint two ounces of Alum, add half an

an ounce of Verdigreaſe, and heat them gently over the Fire, and then ſuffering it to ſtand for twenty four hours, ſtrike over the Skin with it warm, and ſuffering it to dry, do it again till it has taken the Colour, which will be very lively.

To colour black Leather after the Order in Germany, *&c.*

Take of the Bark of Elder two pounds, of the filings or ruſt of Iron the like quantity, put to them two Gallons of Rain-water, and ſtop them up cloſe in a Cask or other Veſſel, and ſo ſuffer them to ſtand for the ſpace of two Months; then put to the liquid part a pound of Nut-galls beaten to Powder, and a quarter of a pound of Coperas, heating them over the Fire, and ſuffering them to ſtand twenty four hours after, and ſo uſe them with a bruſh, till the Skin has taken an excellent black.

To colour white Leather the beſt way.

Having hung your Skins in Chalk, or Lime-water, till they are grown ſupple, that the Hair or Wool may be ſtripp'd off, ſtretch them on Tenters or by Lines, and ſmooth them over; then take your colouring mixed according to the Purport of what you intend they ſhall take, and having firſt bruſhed them over with Alum water very warm, give them the Tincture, and dry

dry them in the Sun or in some warm house, and they will be useful on sundry occasions, without any further trouble.

To make white Leather blue.

Take the Berries of Elder a quart, strain out the juice and boil it with an ounce of the powder of Alum, and half an ounce of Indico, or smalt blue, and brush over the Leather with a fine brush dipped therein three or four times, suffering it to dry between whiles, and the business will be effected.

To colour Leather a fair Red.

Having rubbed your Leather well with Alum-water or alumed it, take stale Urine, seeth it and scum it till half be wasted; put then to it an ounce of the finest Lake, with the like quantity of Braziel in Powder, an ounce of Alum, and half an ounce of Sal-armoniac, mix them well and keep them stirring over a gentle Fire about two hours, and so use the liquid part, and your expectation will be answered.

To colour your Leather a curious French *yellow.*

Take one part of Chalk, and another of Wood-Ashes, and make thereof a good Ley, then strain out the fine or Liquid matter, put it into a Vessel over the Fire, and put into it Turmerick

merick in Powder, and a little quantity of Saffron, and so suffer it to simper, till it becomes pretty thick; then set it to cooling, and as you have occasion use it, as before mentioned.

To colour Spanish *Leather*, &c.

Take that which the *Dutch* call Pomplemelch, warm it, and rub the Leather therewith, then take of Venis tot Appelen, and having beaten it small, put a considerable quantity of fair water to it, and let it soften over a gentle Fire; then press out the water, and so in the liquid part rub or wash the Skin, doing it so often; and after that, take Shooe-makers black the finest, and rub over the Skin with it, having in the wetting added to it a little Vitriol or Coperas, and suffering it to dry, take Goose or Hogs-grease in a Woollen Cloth, and rub the Skin over for a good space, where there is a good Fire to supple it in, and then rub it over with your hands, till it disappear, or instead of Grease, Line-seed, or train Oil may be used, and so in case of any other Colour, according as the Colours are designed.

To dye Bristles a curious red for Brushes.

Take an ounce of Brazil-Wood in Powder, half an ounce of Alum, a quarter of an ounce of Vermilion, and a pint of Vinegar, boil them up to a moderate thickness, and dip the Bristles in when it is very hot, suffering them to continue so for

or ſometime in the Liquor, and they will be of a curious Red.

To dye Briſtles or Feathers a curious green, &c.

Take of Verdigreaſe an ounce, Verditur the like quantity, Gum-water a pint, mix them well together, and dip the Briſtles or Feathers, they having been firſt ſoaked in hot water into the ſaid mixture.

To dye Briſtles or Feathers blue.

Take an ounce of Indico, as much of Biſſe, as much Alum as a Hazle-nut, put them into Gum water, and dip the materials into it hot, hang them up to dry, and clap them well, that they may open. And ſo changing the Colours, you may in this manner dye the aforeſaid materials of any Colour, as for black uſe Log-wood, and Galls, for Purple, Lake and Indico; for Carnation, Vermilion and Smalt, for yellow, yellow Berries and Saffron with a little Tartar mingled or diſſolved in your Gum-water.

To dye Ivory, Bone, or Horn a curious red.

Take the materials and ſoften them in water wherein Tartar has been diſſolved; then take Vermilion and Braziel, tempet them well in water, boil them up in a Liquor, and put your Horn, Ivory, or Bone into it, and ſuffer either

of

of them to be there, it being hot, for a conveniene time, and taking them inſtantly out caſt them into cold Alum-water; and if they have not taken the Tincture at firſt, uſe them in the like manner a ſecond time; and ſo proportioning the Colours, you may in this manner proceed to make them take what Colour you pleaſe.

To marble Books or Paper the beſt way.

Take four ounces of Gum-Arabick, diſſolve it in two quarts of fair water; then provide ſeveral Colours mixed with water in pots or ſhells, and with peculiar pencils to every Colour, ſprinkle them by way of inter-mixture upon the Gum-water, which muſt be in a Trough, or ſome broad Veſſel; then with a ſtick curl them and draw them out in ſtreaks, to as much variety as may be; which done, hold your Book or Books cloſe together, and only dip the Edges in on the top of the water, and Colours, very lightly; which done, take them off, and the plain Impreſſion of the Colours in mixture will be upon the Leaves, doing as well the ends as the Front of the Book in like manner: and in this caſe, you may do paper by dipping it on the flat, as alſo Linen Cloth, &c.

To dye or colour Horſe hair, or any hair, &c.

Steep the water, wherein a ſmall quantity of Turpentine has been boiled for the ſpace of two

two hours; then having prepared your Colours very hot, boil the Hair therein, and any Colour, black excepted, will take, but that will only take a dark red or dark blue, &c. And after this manner with Colours cold, or but luke-warm, you may dye the feathers upon the backs of Poultry, wild fowl, hair on Dogs, Horſes, or the like, in as much varieties as your Fancy can ſuggeſt.

Another fair red for Skins, &c.

Wet your Skins or Fells in Alum water, in which has been diſſolved a like quantity of Salt with half as much Lime, when being again ſtretched and dryed, take the laſt of Brewers drink a quart, put into it an ounce of Braziel powder, a quarter of an ounce of Vermilion, and an ounce of Alum-powder, thicken them over a gentle Fire, by continual ſtirring, and ſo with a bruſh or Cloth, rub over the Skins at an evenneſs, not laying it thicker on one place than another, and ſo do three times ſucceſſively, ſuffering them only to dry the mean while, and your expectation will be anſwered.

To dye Skins a crimſon Colour, &c.

Scrape hard ſoap three ounces, and diſſolve it in fair water, add to that three ounces of Alum, boil them over a gentle Fire, till the water grow clammy, or a little inclining to thickiſh; then put in a few grains of Cochinele

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half an ounce of Lake, two ounces of red lead, and a quarter of an ounce of Vermilion, and a ſmall piece of Indico, mix them well by ſtirring together, and keep them upon a gentle Fire, till they are about the thickneſs of the white of an Egg; then having firſt rubbed your Skin over with Alum-water, and ſuffered it to dry, apply this colour, as has been directed in the former.

To colour Skins a light blue or Turkey Colour.

Take Smalt two ounces, red wine a quarter of a pint, Alum two ounces, Vinegar half a Pint, and white ſtarch half an ounce, put them over a gentle Fire, not ſuffering them to become over thick; and then ſoaking the Skins with Alum-water, and ſuffering them to dry as uſually, add to this colouring half a pint of Gum-water tolerably thick, and lay it on, glazing it over when dry with a poliſher.

To colour a light green.

Take the Herb called Horſe Tail, bruiſe it, and add to the juice a ſmall quantity of Verd-greaſe, Alum and Coperas, and over a gentle Fire, make it into a colour; which will prove very pleaſant and delightful.

To dreſs, or cover Leather with Silver or Gold.

Take that which is called brown red, and grind, or move it on a ſtone with a muller, adding

ding-water, and chalk, the latter being dissolved, and with it rub, or lightly dawb the Skins over, till they look a little whitish; and then, before they are quite dry, lay on your Leaf-Silver or Gold, placing the Leaves a little over each other, that no Intermission be found; and when they have well closed with the Leather, and are sufficiently dried on, rub them over with a polisher made of smooth Ivory, or of a Horses Fore-tooth, and you will perceive it very splendid.

Another way of gilding Leather more lasting than the former, viz.

Take Gleer made, or consisting of the whites of Eggs, or you may for want of the former make Gum-water, and with a brush run over the Leather with either of them; which done, lay on your Gold or Silver, and burnish it over as the former.

To make Leather shine without any Gold, &c.

Take whites of Eggs, Gum-water, and powder of Antimony, mix them well together, by beating, and having your Skins well dried, lay the mixture on them, and do it often, till the Leather be quite hid; which done, let the mixtures dry; and then burnish them over; and for want of Antimony, you may use black Lead.

CHAP.

CHAP. III.

How to recover faded Colours in Cloth or Silk, to take Spots, Stains, Pitch, Tar, Roſin, Greaſe, Wax, Oil, &c. out of Silks, Stuffs, Woollen or Linen, to preſerve them from Damage of Worms, Moths, &c. *and other matters,* &c.

To make Cloth that has loſt its Colour recover it and look freſh and bright.

TAke of unquenched Lime two ounces, of the Aſhes of the Bark of Oak, the like quantity, and put them into a quart of fair water, mixing them well, and ſuffering a ſettlement for the ſpace of an hour, drawing off the clear part, and therewith waſh or carry over with a hard bruſh the Cloth, and by twice or thrice carrying it over, it will look fair and bright.

To waſh Scarlet that is ſoiled or greaſie.

Take two ounces of white Tartar, beat it finely, and heat it over a Fire in a pint of fair water, till it be thoroughly diſſolved and very hot, then ſuffering it to cool a little, take an indifferent hard bruſh, and dip into it, rubbing it lightly over with the ſame, and by ſo doing in

a ſhort time it will return to its firſt Eſtate and Colour.

To reſtore Silks of any Colour in the like nature as the former.

Take an ounce of unſlaked Lime, and the like quantity of the Aſhes of Vine Branches, and as much of Oak-Bark, mix them well together in fair water, and make a kind of a Ley with them over a gentle fire; which being ſetled, take the clear part, and with a bruſh or ſponge rub over the faded part, and it will in a ſhort time reſtore it.

To make a Soap to take Greaſe, Spots, or Stains out of Cloth, Stuffs, Silks, &c.

Take a pound of Roch-Alum, burn it well, and beat it into Powder, add to it the powder of the roots of Florence-flame, an herb ſo called, about half a pound, and to theſe add a new laid Egg, and two pound and a half of Cake Soap, make them up with fair water into round balls; and when you are deſirous to take out any Spot or Stain, waſh well the place firſt with warm water, and then lay a laying of this Soap upon it for three or four hours; and then waſh it off with other warm water, and in often ſo doing they will diſappear.

An other excellent and approved way.

Take Wood Sorrel and diſtil it in an Alimbeck with Fumitory, and waſh the damaged place therewith, and it will in frequently ſo doing reſtore it.

A way to take Spots out of Linen or Woolen, if coloured.

Take of the juice of a Limon, two ſpoonfulls, one Spoon full of the *Juice* of an Onion, and warm them over the Fire, and with them often waſh the Spots, and they will no more appear.

How to make a good Ley to take out Spots and Stains, viz

Put into three pints of Water half a pound of Soap-boilers Aſhes, and ſuffer them with daily ſtirring, to remain in it for the ſpace of four days, then pour off the clear water; then mix it, as you ſee convenient with Fullers Earth, and lay it hot on the place, and it will with often uſing effect your deſire.

A very good way to take Spots of Oil out of Cloth.

Take Oil of Tartar, and mixing it with the powder

powder of a burnt bone, apply it to the ſpot, and hold over or upon it a ſpoon wherein is a live coal, and the heat thereof will attract the greaſe and render the ſpot inviſible.

To take Pitch, Tar, Roſin or Bees wax out of any Stuff, Silk or Cloth,

Take Oil of Turpentine, warm it a little, and apply it to the place, ſuffering it to ſoak in for the ſpace of an hour; and then gently rub it, and you will perceive the Roſin, &c. loſened and inſtantly to crumble away.

A Soap water to take out any manner of ſpots, how to make it.

Boil Straw-berries, or the Leaves thereof in a quart of fair water, and a pint of Vinegar; then add two pounds of Caſteel Soap, and half a pound of Chalk finely ſcraped, boil them till the moiſture is conſumed, and when you have Occaſion, wet the place with ſharp Vinegar, and rub it over with this Soap, drying it afterward againſt a Fire or in the Sun.

A ſpeedy way to take all manner of Spots, or Stains, out of Scarlet, or out of Velvet, of what Colour ſoever, not changing it.

Take Soap-wort, an herb ſo called, ſtrain out the Juice, it being bruiſed, add to the Juice a ſmall

mall quantity of black Soap, if the Scarlet be t dyed in clear grain, and theſe being made in, waſh the place with the liquid part, ſuffring it to dry between whiles, and by this neans in a day or two, you will perceive the Spots to diſappear.

To take Iron Moulds or Stains out of Linen.

Take the Juice of a Limon, warm it with a little Powder of Alum diſſolved in it, wet it, and as it is wet, dry it with a ſpoon, wherein is a live coal, and ſo continue to do for the ſpace of two hours, and the Spot or Iron-mould in a waſhing or two will diſappear. This likewiſe will take out Spots of Ink, *&c.*

To take out oily Spots out of parchment or oily Paper the manner.

Take the Powder of burnt Bone, finely ſifted, nd place between two boards, preſſing it hard, ome of the powder on either ſide the Spot, and two days it will be quite vaniſhed.

An excellent way to take Spots or Stains out of Linen, viz.

Take fair water, and diſſolve it in Bay-ſalt, nd ſteep the Linen therein; then take juice of rrel and ſharp Vinegar, and rub the Spot with them

them, ſuffering it likewiſe to ſoak in, and in ſo often doing it will diſappear.

To take away Ink-Stains, Stains with Fruit, &c.

Take the powder of Alum half an ounce, the juice of Houſleek or Sengreen two ounces, and apply them, the Alum being diſſolved very hot, and the buſineſs will be effected.

Inſtructions how to keep Silks from ſtaining in the waſhing.

Heat rain water, and when it is very hot, put into it caſteel Soap, diſſolve it well; then ſuffer it to be almoſt cold, after which, ſprinkle in a ſmall quantity of fulling Earth, and ſo ſcow out your Silks; then ſuffer them not to lie on heaps, but ſpread them, and clap them betwee clean dry Cloaths, and they will be freſh and fair.

Directions to keep Linen layed up without uſing from Damage for many Years.

Having waſhed, and well dried your Line the Sun, fold it up, and ſcatter in the foldi the Powder of Cedar-wood or Cedar ſma ground, having firſt perfumed your Cheſt wi ſtorax; by which means, not only dampneſs prevented, but Worms or Moths, &c.

Furth

Further Directions, to keep Woollen or Linen ſweet and pleaſant, as likewiſe from being damaged by Moths, Worms, &c.

Take Orange Peels, dry them in an Oven, and beat them to Powder, add to that Powder of Elicampane roots, the Powder of Arras, and that of Juniper, and air your Cloaths, when you lay them up, over a Fire wherein Bay-leaves are caſt and burnt.

A pleaſant water to preſerve Linen or any other thing a long time, giving it moreover a curious ſcent.

Take of Spike flowers two pound, Coſtmary one pound, Balm an handful, penny-royal as much, Mace two ounces, Arras Powder an ounce, ſoak theſe in White-wine, and diſtil them, and ſprinkle your Cloaths in a fair day, ſuffering them afterward to dry, and then lay them up.

A good way to waſh any Linen or Woollen interwoven with Gold or Silver, and not to impair it.

Dip the part you deſign to favour in Urine and Alum, and ſuffer it well to be ſoaked; then ſoap the reſt, but not that place, and having waſhed it, hang it to dry in the ſhade, and your expectation will be anſwered.

To remove ſtains occaſioned by Wine or Vinegar.

Take new Milk, and ſteep the thing ſtained therein a night; then take Runnet, and apply to the Stain, rubbing it in; and by ſo doing twice or thrice, you will find it fair as at firſt.

To make Linen that is turned yellow, very white.

Heat Milk over the Fire, and add to a Gallon a pound of Cake ſoap ſcraped in, ſo that it may diſſolve, and when the Cloaths have boiled therein, take them out, and clap them into a Lather of hot water, and waſh them out ſpeedily.

To whiten Cloth the beſt way.

Take your Cloth, and buck it well; then ſpread it upon the Graſs, and ſprinkle it with Alum-water, ſuffering it to continue abroad for three or four days; then buck it again with Soap and fullers Earth, and uſe it as before, and ſo it will be both thick and white.

CHAP. IV.

Directions to ſcowre Silver and gold Lace, make Plate bright, and look like new, take Spots and Stains out of it, to diaper Linen, whiten Ivory, make Cement for broken Glaſſes, &c. Perfumes of divers kinds, Musk-balls, and many other things and matters, &c.

To ſcowre Silver, and Gold Lace, and to reſtore it to its firſt Luſtre, as alſo Imboſs, or Imbroidery.

TAke the Lace, and lay it as ſmooth as may be upon a dry Woollen Cloth; then burn Alum, and beat it to Powder, ſifting it afterward through a very fine ſieve; then with a bruſh, rub it gently over the Lace, and by ſo doing, and often turning it, the buſineſs will come to Perfection. And thus,

To ſcowre, and take Stains out of any Silver Plate, &c.

Steep you Plate in Soap-leys for the ſpace of four hours; then run it over with whiting wet with Vinegar, ſo that it may ſtick thick upon it, and dry it by a Fire; after which, rub off the

whiting, and pass it over with dry bran, and the Spots will not only disappear, but it will look exceeding bright.

To boil up Plate, that it may look like new.

Take of unslaked Lime a pound, of Alum the like quantity, Aqua vitæ and Vinegar of each a pint, and of Beer grounds two quarts, boil the Plate in these, and they will set a curious gloss upon it.

To make any Linen at the first appearance look like Diaper.

Take it when new washed, spread it upon a Table somewhat damp, and sprinkle it over with a brush dipped in Alum and Rose-water, in form and manner, as best shall suit with your fancy.

To whiten any piece of Ivory, that is turned yellow, as also Bone, &c.

Take a pound of Quick-lime beat small, and place it on the Ivory, till it be covered; then pour gently, and by degrees Vinegar thereon, and so suffering it to lye for the space of twenty four hours, take it out, and rub it with Alum-Powder, and the first whiteness will be restored; and in the like manner Bone may be used and ordered.

To cement broken Glass, or China ware a good way.

Take the whites of two Eggs, half an ounce of Quick-lime beaten to Powder, a dram of the Powder of burnt Flint, and the like quantity of Gum-sandrick, temper them well together, and, add for the better moistening a little Lime juice; then with a Feather anoint the edges of the broken Vessels, and clap the pieces together by a warm Fire, and if your hand be light and steady in the Performance, the Fracture will hardly be discerned.

To remove Spots and Stains out of very thin Silks, &c.

Take White-wine Vinegar a pint, make it indifferent warm, then dip a black Cloth into it, and rub over the Stains, then scrape Fullers-Earth on it, and clapping dry Woolien Cloaths above and beneath, place an Iron indifferently hot on the uppermost, and it will draw out the Spot, &c.

To make an excellent Perfume preventing pestilential Airs, &c.

Take Benjamin half an ounce, Storax the like quantity, as much of Galbanum, temper them being bruised into Powder with the Oil of

Myrrh, and burn them in a Chafing-dish, or for want of these, take Rosemary, Balm and Bay-leaves, heat them in Wine and Sugar, and suffering the moisture to consume, let them likewise burn by the heat of the pan, and they will cast a curious scent.

To perfume Cloths.

Take the best Cloves an ounce, dry them in an Oven, and beat them to Powder, do the same by a like quantity of the Wood of Rheubarb and Cedar, and sprinkle them in your Box or Chest, and they will not only cast a curious scent, but likewise preserve them against Worms and Moths.

A curious Scent, or Perfume, to carry with one, when going abroad in damp Airs, or to visit sick or infected Persons, and is wonderful good for all Pains in the head.

Take Orange-flower Butter an ounce, Oil of Nutmeg, a quarter of an ounce, Amber-greese a dram and Civet a scruple, mix them well together, and carry a small box of it about you, smelling to it as you have occasion.

To make a sweet scented Powder very pleasant.

Take Rice-grounds, and the small of white Starch a like quantity, pound them in a Mortar, and

and ſift them well through a fine ſieve, dry the duſt in an Oven or before the Fire; then infuſe to each pound a grain of Civet, and half an ounce of Roſe ſcent, and keep it cloſe looped up, till it be well infuſed; and then uſe it for your Hair, or otherways at your diſcretion.

To make ſcented Waſh-balls the beſt way to keep, &c.

Take Caſteel Soap, ſcrape it into new milk, and heat it over the Fire, till it melt and again become thick, then put a ſmall quantity of Amber greaſe, Lavender cotten flowers beaten, and dryed, till they are as fine as Meal, and a little Spirit of Cloves or Cinamon, and ſo make them up into balls, and lay them a drying in a warm place, but not in the Sun.

A Perfume to drive Vermine out of a Houſe, &c.

Take Burgundia-Pitch an ounce, Brimſtone half an ounce, Storax the like quantity, the Powder of Mother-Amber a dram, beat and mix them well together, and burn them upon a Chafing-diſh, and where the ſcent comes, the Mice and Rats will fly with much ſpeed to avoid it.

An Ointment or Perfume to remove an evil ſcent that hat tainted the brain, &c.

Take of the Oil of Bay-berries, half an

ounce of the Powder of Frankincense a dram; the Oil of Mace or Spirit a scruple, as much of the Oil of Turpentine, mix them well together, and keep them in an Essence bottle.

An Essence that will immediately perfume the place. How to make it.

Take Cinamon an ounce, Camphora half an ounce, Opopanax a dram, Roses clean picked a handful, Rue and Rosemary flowers the like quantity, the Gum of Myrrh a dram, bruise them well, and put them into a small Alembick or glass retort, and take the Essential part in a Bottle, stopping it close, unless when occasion requires it, and then by opening it, you will suddenly find the Effects answer your Expectation.

CHAP. V.

The curious Art of drawing in all its Perfection, as well humane Bodies, as Birds, Beasts, Fish, Landskips, Building, and many other rare Portraicts, by plain and easie Rules, in due proportion and manner.

SEeing limning or drawing is an Art very curious, much admired, and sought after in all Ages, and especially in the present, I have thought

thought it convenient to lay down Methods and Rules for the Instruction of Learners especially, thereby to inable them for greater acquirements, &c.

The first material thing to be known, is, the necessary Instruments requisite to be used on this occasion, which are first Sallow-coals, or Sallow-wood burnt to a Char-coal, that it may be sharpned in the form of a Pencil, to touch over lightly the first draught. Secondly the out Feathers of a Duck's Wing, to wipe off, as you see occasion, what is superfluous, or the matter designed to be altered. Thirdly, black lead Pencils well pointed to go over your draught the second time. Fourthly, Pens made of Ravens or Crows Quills, to finish the design, by giving a more curious piece. Fifthly, a rule and a pair of Compasses with three points to take in and out at pleasure, the one for black Lead, the other for white chalk or red, or any other paste, and the use of the compass is to be observed in most drawings, to mark out the equal distances after your out-stroaks are drawn.

Having the forementioned things in a readiness proceed to practice, and in the first part begin with a plain Geometrical Figure, such as are found to be the Circle, Oval, square, cone, Cylinder, Triangle, which accordingly, you may mark out with your rule and compass, till you can readily do it without them, for a Circle well carried will much avail you in any other Solar Form, as the Sun, Moon, Globe of the World, &c.

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&c. The Oval is a direction for the Mouth, Face, the Foot of a Wine or Beer Glass, &c. The Square is very useful in confining the Picture, you are to copy. The Triangle wonderfully assists you in making half a face. The Cone will assist you in drawing Colosses Spires of Steeples, and the like. The Cylinder assists you in drawing Pillars, pilasters, Columns, together with their Ornaments proper to Architecture, &c.

Having considered the matters premised, proceed to draw Pears, Cherries, Apples, Apricots, Peaches, Grapes, Straw-berries, Peatecods, but Terfles and other Insects with Flowers and Branches of Trees in their proportion, and being a little perfect at these, proceed to the third practice, which is usually imitating Beasts, As.

1. Those that are more heavy and dull, *viz.* the Elephant, the Bear, Cow, Ox or Bull, and sometimes Sheep and Goats; then those more nimble and fleet, as the Horse, Stag, Hart, Unicorn, Tyger, Lyon, &c. And for Birds, practise the Eagle, the Swan, the Kings Fisher, the Parrot, the Partridge, the Pheasant, and such like; then again, for Fish, the Whale, Salmon, Pike, Carp, Herring, Mackrill, Lobster, and such other fishes, as are most in use, to adorn a Chimney-piece, or any the like matter or business, and from these, proceed to Mellions, Pumpkins, Ears of Corn, Cucumers, Parsnips, Carrots, Cabbages, &c. when

when having practiſed your hand in their proportion, and knowing the proper Colours, of which I ſhall treat hereafter, you may eaſily form and illuſtrate them, though the excellency of this Art conſiſts in drawing a humane Body to the life: And becauſe it ought not raſhly to be all drawn at once, I ſhall proceed to theſe in order, eſpecially as to the rules in general.

CHAP. VI.

To draw the Face in divers Poſtures and Proportions, the moſt exact Rules, and what of variety is to be conſidered therein.

For drawing the face, general Rules, &c.

IN this caſe curiouſly obſerve the face in its motion, whether upward, forward, downward, or ſide-ways, touching lightly the features, where the Eyes, Noſe, Mouth, and Chin ought to ſtand; then more perfectly go over them, for the Circles, Squares and Triangles, that are uſed in this matter, may ſerve well enough, to guide your Judgment where to place them. And in this caſe, obſerve diligently the principal Muſcles of a Face, appearing moſt in aged Men or Women. And there is uſual a threefold proportion

portion obſerved in a Face, as firſt from the top of the Fore-head to the Eye brows. Secondly, from the Brows to the bottom of the Noſe, and Thirdly, from thence to the bottom of the Chin, but in ſome the Fore-head is lower, and in others the Noſe longer.

The diſtances between the Eyes conſiſt in a full Face of the length of one Eye, but in a three quarter, or ſide-face, that diſtance is leſſened anſwerable to the proportion. As for the Noſtril, it ought to be exactly placed againſt the corner of the Eye. And in a fat face, you will perceive the cheeks to ſwell, when on the contrary, in a lean face, the Jaw-bones ſtick out, and the cheeks fall in.

You may diſcern a ſmiling countenance, by perceiving the corners of the Mouth to turn up a little, and a frowning or ſowre countenance, by the Fore-heads bending and ſomewhat wrinkling on the top of the Noſe.

To draw a fore-right Face, make the form of a perfect Oval, divided into three equal parts, by two Lines. In the firſt part, place the Eyes: In the ſecond, the Noſtrils: And in the third, the Mouth, obſerving to keep the Eyes diſtant from each other, the length of one Eye, and that their inward corners be perfectly over the out ſide of the Noſtrils.

To draw an upright head, it muſt be made equal with three Lines, every way, either upwards, downwards, higher or lower, and that muſt, as the former, be divided into three equal parts.

To

To draw the Inclining, or fore-ſhortened face, obſerve how the Lines concord or agree together, and with eaſe, you may draw, in their proper places, the Noſe, Mouth, and other parts, with a little Practice, and in theſe forms it is requiſite that you are very perfect as being rules of frequent uſe; for of the many parts of Man's Body, the face is moſt difficult; but having got the true proportion, with your meaſures, you will be capable, let the face turn which way it will, to form it; and further note, that whatſoever proportion the Face you are to imitate bears, your out ſtroaks muſt be formed accordingly.

As for the Noſe, it requires to its due proportion much care and diligence, as being the moſt eminent part of the Face; in which, eſpecially, obſerve the hollowneſs, roundneſs, and indenting of the Noſtrils, &c.

The next thing, eſpecially where the body is to be covered, is to be conſidered of the Hands, in their ſeveral poſtures and poſitions, as well by meaſure, as without, as alſo Hands, and Arms of whoſe poſtures, as well as the former, it would not be unneceſſary for the Learner, to get draughts for his better imitation, which may be had at moſt Picture Shops, for a ſmall matter ready done.

When you have practiſed, and are a little expert in drawing the Hands and Arms, &c. proceed to the drawing of Feet in their ſeveral Poſtures, as well without, as with meaſure; which

which having attained ſeparate, exerciſe your skill in drawing Legs and Feet conjunct or joined together, that ſo underſtanding the frame and particulars of the whole body, you may be the better underſtanding in drawing the Figures in their due proportion and right Poſtures, in doing which there is no ſmall difficulty. And in this manner, having proceeded to form the Members, draw the other parts of the body, as the Shoulders, Back, Breaſt, Belly, Secrets, Thighs, and the like, and laſtly take care in due proportion to join them, that they may appear firm aud compleat.

Coming to practiſe upon an entire body the beſt way is to begin with thoſe of Children; and my reaſon is, becauſe they are generally fat and plump, and rounder than the Bodies of Men and Women, and conſequently require ſo much curioſity in the obſervation of Muſcles and other Features, which render the drawing leſs difficult.

As for your further Direction in drawing, obſerve ever to begin at the Head, and ſo proceed by degrees, running the whole lightly over at the firſt, and encreaſing more fully, as you ſee occaſion, ever being careful to take notice, that your parallel Joints, Muſcles, Sinews, &c. be rightly proportioned, and exactly oppoſite; alſo that the motions of the Body be anſwerable to each other, and that the Parts and Limbs have a due Symmetry, not being faulty in the indecency of having one great Arm or Leg, and another

ther ſmall one, nor a great Finger upon a ſmall Hand, neither further than the proportion requires, ſuffer one Limb, or Member to be longer than another; and although it ſo happen, which it frequently does, that at firſt you commit Errors of this nature, yet be not diſcouraged, for frequent practice will redreſs them.

Having thus far proceeded with Succeſs, and being indifferent perfect herein, you muſt conſider what it is to ſhadow; and in this caſe, obſerve the following Rules, *viz.*

The out Lines of the draught of any Picture, give the ſymmetry or proportion, which ought to be ſufficient to a good Judgment, but the Lines and Shadows produce to the leſs curious, the lively likeneſs in ſhadowing; therefore of any Picture, you muſt take notice to caſt your ſhadow always one way, *viz.* on which ſide ſoever you begin to ſhadow your Figure, whether on the right or left Hand, as in the Figure of a Man, if you firſt proceed to ſhadow his left Cheek, the left ſide of his Neck, Body, and all other parts muſt be ſhadowed, unleſs the light ſide of the Figure be dark, by reaſon of ſome other Body ſtanding between the Light and it, as ſuppoſe three men were ſtanding together; then muſt the Body, or Figure in the middle be darkened by the foremoſt, unleſs the light by facing it come between them.

Further, note, that all ſhadows muſt conſequently grow fainter, as they are further removed from the opacous Body from whence they proceed.

proceed. But in caſe of Storms, where Clouds, or Waves, by contending Winds are driven one againſt another, contrary ſhadows are allowed, as ſtriving for Superiority, and ſo you muſt be ſure to ſupply the greateſt firſt, and according to your Judgment, ſupply from them the leſſer.

All circular Bodies muſt have a circular ſhadow, as they have a circular form, and as the object of Light which cauſeth the ſhadow is circular.

And now for your further Information of this kind, obſerve that a Man ſtanding from the top of the head, to the bottom of the feet, is in due proportion eight times the length of the Head. The Arm when it hangeth ſtraight down, reacheth within a ſpan of the Knee; the Hand muſt be the length of the Face, and ſpread broad, muſt cover it, and no more; and further note, that in drawing a Figure ſtanding, you muſt in the firſt place draw that Leg, which the Body ſtands firm upon, or elſe your Figure will undecently decline one way more than another, as if it were falling. The Arms of a Man extended are his full length, and ſo of a Woman in the various particulars. Thus having directed you in the drawing and proportioning naked Figures, I now proceed to give directions about Garments, &c.

As in naked Figures, it is obſerved you draw the out-Lines firſt; ſo you muſt do in Drapery or Cloathing, leaving ſpace within for your greater or leſſer folds; then firſt draw the greater folds, and break them into leſſer

contained

contained within them, and the closer the Garment sits to the Body, the narrower and smaller must be the folds, and in shadowing, the innermost must be the harder, and the outermost softer.

Continue always throughout your Garment the great folds, but as for the lesser, break them off, as you see convenient, and the finer your drapery is, the fuller, and sharper must your folds be, and the shadow the stronger, yet more pleasant to the Eye, ever taking notice, that that part of any Garment that sits close, as the body Coat of a Man, the Breasts of a Woman, and the like, must not at all be folded, but rather with a sweet shadow represent that part of the Body, that the Garment appears to cover, as Woman's Breasts, with a sweet round shadow, &c. And thus much for the body of Man in drawing.

CHAP. VII.

Land-skips, what they are, and what is required in the drawing, and curious proportioning them pleasant to the Eye of Fancy, &c.

A Landskip is that which giveth a pleasant prospect of Trees, Hills, Rivers, Cattle, and other Rural delights, with Towns, Cities, Castles,

Caſtles, Promontories, Rocks, Ships, Boats, Barges, and whatever the fancy of that kind can form. To expreſs which, and make all truly appear naturally, as they ought, according to the true proportion and diſtance, obſerve in every Landskip, to make a very fair Horizon appear, the Sky either clear, or over-caſt with Clouds, expreſſing the riſing or ſetting of the Sun, to iſſue as it were from or over ſome Hill, Mountain or Rock; but in a fair Landskip, beware you expreſs not the Moon or Stars, which are only to be ſeen in a Night-piece; and in caſe, ſuch a piece be required, you may draw an Aſtronomer with his Quadrate, taking the height of the Moon, another with his Croſs-ſtaff, taking the diſtance of certain Stars, ſome ſtanding with a dark Lanthorn far from them, to give them knowledge of their degrees, an Owl flying in the Air, Men catching of Partridges with low Bells, a Woolf worrying of Sheep and the like, being natural to ſuch pieces.

If in any fair Landskip you expreſs the Light of the Sun, ever obſerve, that throughout your whole Piece, you caſt the Light of your Trees, Buildings, Rocks, Ruins, and all things mentioned, or expreſs'd within the work thither-ward: obſerve further to leſſen your Bodies proportionably, according to the nearneſs, or diſtance they ſhould naturally appear, ſo that the further the Landskip goeth from your Eye, the fainter you muſt expreſs any thing ſeen at diſtance, till at

at last the Earth or Water, and Sky seem to meet, as do the Colours in a Rain-bow, wherefore when at any time you see good pieces of this kind, take your observation more particularly from them, and imprint the fancy, as well as may be in your mind.

CHAP. VIII.

The curious and much esteemed Science of Painting or Limning in Water Colours, and how exactly to proceed therein, either on Parchment, Glass or Copper, with the mixture, and distinction of the sundry Colours, and other rare Curiosities.

HAving gone over that which we may properly term limning, or as many will have it drawing, I now come to that part, vulgarly known by the Appellation of Limning, viz. laying in water Colours the most curious of all, and much practised by Persons of the best Quality.

To fit your self, and prepare for the practice of this, you must have Gums of all sorts to make your waters as occasion requires; also a Marble flat stone, a Muller, Colours of various sorts, liquid Gold and Silver, Size to lay Gold,

&c.

&c. Parchment, of the fineſt pencils of ſundry ſorts, pots and Shells to put your Colours in.

To make your Gum-water take Gum-arabick, white, clear, or tranſparent, for that which is yellow, or of an Amber-Colour is inſignificant; tie up a quantity in a rag, and hang it in fair water, till it be diſſolved; then the water being ſtiff enough for your purpoſe, mix your Colours with it, always having two ſorts to make a weaker or ſtronger, as the matter requires.

Gum-lake is a compound Gum, made of whites of Eggs, finely beat, Honey, Gum, of Ivy, ſtrong wort, &c. which being well mingled and beat together, they will run like Oil, and in the end harden, and this you may buy ready made, as the former, obſerving only, that it be clear and tranſparent.

As for the Colours, there are ſimply ſix, *viz.* white, black, red, yellow, green, and blue, to which ſome add browns, but they are generally compounded, and of either of theſe, there are ſeveral ſorts, as theſe, *viz.* Blacks the beſt, are burnt Ivory, Cherry-ſtones, Lamp-black. The whites are Ceruſs and white Lead. The reds are red Lead and Lake. The Blews are Indico, Ultramarine, Biſe-ſmalt. The Greens are biſe, Sap-green, Pink, Cedar-green. The yellows are Engliſh Oker and Maſticote. The Browns are Umber, Collens-earth, *Spaniſh* brown.

Theſe (though there are others) are the principal Colours in limning, and therefore you chuſe

chuſe to ſpeak of theſe only in this place, the others omitted, being fit only to colour Pictures or waſh Maps, &c. and of theſe

The Colours to be waſhed are Biſe-ſmalt, Cedar, Ultramarine, Maſticote, and red Lead. The Sap-green is only to be ſteeped, and the reſt I have meationed are to be waſhed and ground.

To waſh Colours, you muſt put a quantity of the Colour intended into a clean earthen diſh, and pour water thereto very clear, ſtirring the Colour and water together, ſuffering it to ſtand a while, and perceiving the greaſe or ſcum to riſe, take it off, and pour out that water, putting other water to the Colour, &c. and ſo do, till the water become clear, and the Colour at the bottom remain fine; then pour away the water gently, and you will find the Colour ſticking about the ſides and edges of the diſh, as alſo at the bottom, and if it ſo happen, that you can get an ounce of pure Colour out of a pound (tho' the reſt is ſerviceable for many uſes) it is ſufficient.

In ſteeping Sap-Green, you muſt put it only into fair water, adding a fourth part of Alum-powder to raiſe the Colour, and at the end of twenty four hours it will be a curious green.

As for the Colours that are to be waſhed and ground, take a ſmall quantity of either, and put it into a clean ſhell, adding a drop or two of Gum-water, and work it about the ſides of the ſhell with your finger, ſuffering it there to ſtick,

till

till it is dry; then draw over it your Finger, and if any come off, then you must add more Gum-water, but being dry, if it glitter or shine, it is a token there is too much Gum in it, which you must remedy, by tempering it up with fair water only.

There are some Colours, as Umber and Lake, which parch and crack when they are dry, and therefore to bind them, you must temper them with fine Sugar-Candy dissolved in fair water, and so you must do by other hard Colours subject to this defect.

To burn the Colour thereto appropriated, put them into a crucible, cover it with a Lid of Clay, and set it on a hot fire, and suffer it to be red hot, and when the Colour is cold, you may wash or grind it, as the Nature requires, but do neither before they be throughly burnt.

To grind the Colours, I have directed so to be used, take a quantity of any of them cleansed from dirt and filth, and laying it upon your stone, bruise it a little with your Muller; and then with fair water grind it, till the Colour be very fine, then have in readiness a large chalk stone with troughs, or furrows in it, and pour your Colour into it, and there suffer it to remain till it be well dry, at what time take it out, and reserve it in Papers, or Boxes for your use.

Of these six simple Colours, adding the brown, many may be compounded for faces of all Complexions, Garments, Land-skips, Building, Rivers, Birds, Fish, Beasts, &c. As this

To make Violet Colour take Indico, white and Lake, and at pleasure, you may, as you take more or less of a Colour make it lighter, or darker at Pleasure.

Lead Colour, you may make of Indico, and white mixed and tempered together.

Make Flame Colour, or Colour for flaming Fire of red Lead and Masticote heightened with white.

To make a scarlet Colour, take red Lead, Lake, and a small quantity of Vermilion: For note, that the latter is not good in limning.

To make light green, take Pink, and Smalt with white, to make it lighter, as occasion requires.

To make a purple Colour, take Indico, Spanish brown, and white well tempered and heightned

To make a Bay Colour, take only *Spanish* brown and white.

To make a Murrrey Colour, take Lake and white.

Many other Colours are made by mixture, too tedious here to be recited; wherefore, I leave them to the discretion of the Practitioner, to mix them suitable to his work or fancy, and proceed to the practical part of this curious Art, &c.

CHAP. IX.

Instructions for the preparing your Tablets, and laying on your Colours in their graceful Shadows and proportion, and what is to be observed, as to the Lines in the Face, Complexion, and Procedure in drawing curious, and many other matters.

WHen you have prepared your Colours, prepare likewise good Pencils; to know them, draw them wet through your Mouth, and if they come to a hair, or sharp point, they are good, but if they after that stand rough, or hairs stare, or start out at the side, they are nought, and to be rejected.

The next thing is to prepare your Table; and in this case, get a fine Paste-board sleeked as smooth as a Card; then fine Parchment or Vellum, and starch it upon the board, as smooth and even, that no wrinkle, or rising may appear; to perfect which, you must lay the Parchment side on your Stone rubbed very clean, and polish the contrary side, and so let it dry in the shade.

Having thus prepared a Table, as big as you intend your Picture, chuse a Light fair and large, free from shadow, being if possible a Sky-light on the top of a house, yet such a one, as the Sunbeams do not penetrate, or glance upon, observing

to

to begin and end your work by one and the same light, keeping the room clean, that no dust may fly about to prejudice your work.

The next thing to be considered is your manner of sitting; and in this case, let your Desk be so placed, that when you sit before it, your left Arm may be placed toward your light, and your right Arm from it, that your light may flaunt upon your work. And if you are to draw the Picture of any live Person, the posture being agreed upon, suffer him or her to sit above two yards distant from you, and as level with you as may be, marking well, that whensoever the Party moves, though never so little, for never so little motion of the Body or Face, if not recalled, may occasion in a short time many Errors, and when you undertake this, the following Materials are requisite to be near you, *viz.*

Two small dishes or sawcers with clean water, the one to wash your Pencils in when foul, and the other to temper your Colours withal; a fine large Pencil to cleanse your work, called a Fitch-pencil; a sharp Pen-knife to take off hairs, coming from your Pencil or Spots, that may fall upon your Card; a Paper having holes cut therein, to lay upon your Card, to cover it from dust, and to rest your Hand upon.

If your Carnation, or flesh Colour be tempered up, it must be somewhat lighter, than the Complexion of the Party you are to draw. If it be a fair Complexion, you must have white Lead, and red Lead well tampered. If the

Complexion be ſwarthy or brown, add to your white and red Lead, Maſticote, or Engliſh Oker, or both, if occaſion require it; but let the Complexion be what it will, be ſure to tamper your Fleſh Colour lighter than the Party to be drawn; for if it be too ſad, there is no remedy; and obſerve to place your Shadows diſtinct from each other in a large ſhell: And note, that in all your Shadows, you muſt uſe ſome white; wherefore in the firſt place, lay a conſiderable quantity of white by it ſelf, over and above what the ſhadows are at firſt tempered withal. In the ſecond place, for red uſual to the cheeks, and Lips, tamper Lake, and red Lead. In the third place, for your blue ſhadows, as Veins, or under the Eyes, take Indico and white. In the fourth place, for your faintiſh green ſhadow, take Engliſh Oker, White, and Indico, or ſometimes Maſticote. In the fifth place, for a deep ſhadow, take white, and Engliſh Oker, and Umber. Sixthly, for Dark ſhadows, in the Faces of Men, take Lake and Pink, for they make an excellent fleſhy ſhadow. And theſe being the chief ſhadows, I leave what may further occurr of this kind to your diſcretion.

Having all things in readineſs, the next thing you proceed to, is to draw the face, in doing which; take the following method, *viz.* lay the ground, with the Colour anſwerable to the Complexion of the Party; and then begin the draught, the Party ſitting. Now to finiſh a Face three Operations of ſitting are required. At the

the first sitting, you must only lay the dead Colour. At the second, go over the Face more curiously, nearly observing whatsoever may conduce to the Grace, or Deformity of the Person to be drawn, considering it in a sweet dispose, and well couching the Colours one within another. And in this sitting, you perfect what only was rough before, by laying on the deep Colours, so that at the third sitting, you may finish the Face, as in the Eyes, Eye-brows, Hair, and Ears, which things are the last work, and not to be perfected, till the Hair, Curtain, or Back-side of the Picture, as also the Drapery be finished. And of these sittings in their Order.

The Operation of the first sitting, &c.

Having laid your ground for the general Complexion, the next work must be to draw the out-Lines, which you must effect with Lake, and white mingled drawing very faintly; so that if you chance to miss your proportion, you may alter it with a deeper mixture of the same Colour.

Having drawn the proportion of the Face, add to the former Colour a small proportion of red Lead, tempering it faintly to the Colour of the Cheeks, and Lips, at the tips of the Chin, and Ears, about the Eyes, and the roots of the Hair, placing the red shadows; and as for the shadows, they must not be put in with the flat of the Pencil, but with small touches after the man-

ner of hatching, and in this manner going over the Faces, you will cover your ground with these and the like Shadows, and in these dead Colours, your curiosity need not be great, only strive to imitate Nature, as near, as may be, for the roughness of the Colours may be mended at the second Operation.

Having duly placed, and proportioned your red shadows; in the next place, put in your faint blue shadows about the Corners of the Eyes, and Balls, &c and your greyish blue under the Eyes, and about the Temples, working them sweetly and faintly over by degrees, heightning the shadow, as the Light falls; as likewise the hard shadows in the dark side of the Face under the Eye brows, Nose, Chin, and Neck, with some stronger touches on those places, than on the light side of the Face, and so bring all your work together to an equal roundness, giving Perfection to no particular Part, at this time, but take a full view of your object; and consider, how near you hit the Life, not only in seeming likeness, but roundness, boldness of Posture, colouring, and such like. And having by this time wrought your fainter shadows into the red shadows, you may venture to take a touch at the hair, disposing it in such curls, folds, and forms, as you shall see convenient for Grace and Ornament, only drawing it with some Colour suitable to the Life, and fill up the empty space with Colours, deepening it somewhat more strongly, than before in the deepest shadowed places

ces, and this may ſuffice for the firſt Opera tion.

The ſecond Operation or ſitting.

In this ſitting, the party muſt take the ſame Place, and Poſture, as before; and then be curious to delineate with your Pencil, the particular varieties of Nature, and as you drew them over but rudely before, you now muſt ſweeten them with the ſame Colours, by working, and driving them one into another; ſo that no rough edge, nor lump of Colour may appear, and this muſt be done, with a Pencil ſharper than the former, by which means the ſhadow may be ſoft and ſmooth.

Thus having done, proceed to the back-ſide of your Picture, and if there a Curtain; as is the uſual manner, be required, we will ſuppoſe it to be blue Sattin, and to do it, temper as much Biſe in a ſhell, as will cover a ſmall Card, ſuffering it to be moiſt and well bound with Gum; then draw with your Pencil the outlines of your Curtain, as alſo of your Picture, and ſo lay it over very thin, and airy with a large Pencil, that it may be the whole ground, you intend to do with blue; and then lay it over again with a ſubſtantial body of the ſame Colour; in doing which, you muſt be ſwift, keeping your Colour moiſt, and not ſuffering any part to be dry till all be covered.

If it happen that your Curtain is to be Crimſon, you muſt trace it out with Lake, and lay the ground with a thin Colour, obſerving where your ſtrong Lights and Reflections fall, there lay the Lights with a thin, and wateriſh Colour, and the Ground being yet wet, lay the ſtrong and hard ſhadows cloſe by the other Lights, with a dark Colour temper'd reaſonably thick.

Thus having layed your back-ſide, which in the ſame manner you may do with any Colour. Your next work is, to lay your Linen of a fair white, and your Drapery flat with the Colour you intend it. Then take another view of the Face, and mark well what ſhadows are too light, or too deep, and endeavour to reduce each ſhadow to its due Perfection; then ſhadow the enterance into the Ear, and draw the Lines of the Eye-lid, the deepneſs of the Eye-brows, and all the moſt eminent Notes and Marks in the Face; doing them with a very curious ſharp Pencil, and then heighten the Hair, deepening it, as it appears in the Life, caſting over the ground ſome looſe Hairs, which will look very pleaſant, and make the Picture ſeem to ſtand at ſome diſtance from the Curtain.

In the ſhadowing your Linen, which ought to be very curious, uſe black, white, a little yellow, and a ſmall quantity of blue. The black being deepened with Ivory-black; to which add a ſmall quantity of lake, or Indico: And thus much for the ſecond Operation, from whence I proceed to the third and laſt.

In this, only obſerve to give ſtrong touches, where you ſee Cauſe, or find any Defect, taking more perfect obſervations for the rounding of the Face, which at this ſitting is better done than before, noting diligently, whatever may conduce to ſimilitude, which is the principal in the work; as Scars, Moles, caſt with the Eyes, drawing the Mouth, *&c.*

In caſe of Ornaments, as Garments, *&c.* the ground being laid with Biſe; then the deepening muſt be Lake, and Indico, the Lightning, white, very fine, faint and fair; and in the extreme light places, let what has been ſaid of the blue Drapery ſuffice, and may be underſtood of all other Colours; and for the greater Ornament, you may mix the Light with Gold, or Silver, *&c.*

If the Body is to be in Armour, lay liquid Silver for your ground, and when it is well dried, and burniſhed, ſhadow it with Silver, Umber, and Indico, and work the ſhadow upon the Silver, as the life directs, *&c.*

For Gold Armour, lay liquid Gold for the ground, and ſhadow it with Engliſh Oker, Lake, and a mixture of Gold.

For Pearls, or that colour your ground muſt be Indico, and white, and the ſhadow Pink, and black.

For Diamonds, lay a ground of liquid Silver deepened with Ivory and Cherry-ſtone-black. And thus much for the Face, Body, &c. as to the laying in water Colour, and the next that preſent themſelves are Landskips.

Directions for laying Landskips, &c.

In this caſe, always begin with the Sun Beams and Sky, the lighteſt part firſt; and then the yellow, which muſt be compoſed of Maſticote, and white, the next your blue Skies with Smalt only leaving no part of your ground at firſt uncovered; but lay the Colours ſmooth all over, working the Sky downward toward the Horiſon, ſtill ſuffering it to grow faint, &c. as it draws nearer the Earth, and work the tops of Mountains, and other objects very remote, ſo faint, that they may appear, as loſt in the Air, and as for your loweſt and neareſt ground, it muſt be an Earth Colour of dark brown, inclining a little to yellowiſh, and green, as the matter requires, and the next a lighter green, and ſo ſucceſſively, as they loſe in their diſtance, you muſt abate their Colour, nor muſt you make any thing, you ſee at a great diſtance, perfect, or abſolute, what it really is; becauſe it is altogether conjecture, you cannot abſolutely diſcern it, but expreſs it in Colours weakly, and faintly, as your Eye judges it may be. And ever obſerve in this caſe to place the light againſt the dark; and ſo conſequently, the contrary, which is an excellent way

way, to extend the Prospect far off, yet do it so, as the shadows may lose in their proportion of distance, by degrees, their force, as they remove from the Eye; observing further, that the strongest shadow must ever be nearest. And thus much may suffice for limning in water Colours, which if duly observed, and practised, will wonderfully help the Learner: And in this manner, you may paint upon Glass, by laying on the fairest Colours, if it appear through the Glass first; but if otherwise, lay first a ground, and especially upon Copper.

CHAP. X.

Directions for the most curious Painting, or Limning in Oil, with the various Colours, and materials required on that occasion, with their manner of preparing, and ordering; as also Instructions to paint to the Life, &c. wonderfully pleasing, and much profitable to be known, as well by the Gentry, and others, as those that intend it for their Profession.

AS this Noble Science, in all Ages, has been held in much esteem, and Veneration among Men, in all Ages, it is now more especially

ally covered to be known, and practised, by either Sex; wherefore for the better Instruction, especially of the Learner, I have thought fit to lay down the following plain, and easie rules, which being well observed, and practised, may in time bring him to be a great Master in the Science. But first, of the Colours to be used on this occasion, without knowing which, the rest may prove ineffectual.

The blacks are Lamp-black, Sea-coal-black, Char-coal black, Ivory-black, and Earth of Collen. The white, white Lead only. The greens, Verdegrease, Terra-vert, and Verditer. The yellows are Pink, Masticote, Orpiment, Spruce Oker, English Oker. The blues are Bise, Smalt, Indico, and Ultramarine. The reds are Vermilion, red Lead, Indian red, Lake, and Ornetto. The Colours indifferent are Spanish brown, burnt Spruce, and Umber.

These are the principal Colours to be laid in Oil, and must for the greatest part of them be ground upon your flat stone with a Muller, with Line-seed Oil, though as for Ivory, Spruce, Oker, and Umber, they must be burnt before they are ground. And as for Masticote, Ultramarine, Verditer, Vermilion, Lamp-black, Smalt, and Orpiment, you may temper them upon your Pallet with Oil, saving your self the labour of grinding, &c. and as for these, that are to be burnt you must perform it in a Crucible, and though Line-seed Oil be common to all, yet in case, with your white Lead, you are to

lay

lay Linen, you muſt mix it with Oil of Wall-nuts by reaſon the other will in a ſhort time turn yellowiſh.

The next thing, you are to take care of, is to have good Pencils of all ſizes, a Pallet, or Board, to lay your Colours on, whilſt you are uſing them, and an Eyſil to lay your Cloth upon, or againſt, and a ſtraining Frame, to which it muſt be nailed, and you muſt further have a Stay or Moleſtick, which is made of Braziel, or ſuch Wood, as will not eaſily bend, about a yard long, at one end of which, tie a ball of Cotton in a piece of Leather; ſo that holding it in your left hand againſt the work, you may ſupport your right Arm with it, whilſt you are working; and being thus furniſhed, you may proceed to the work, &c. And firſt of the Complexion.

For a fair Complexion.

Take a ſmall quantity of white, and twice as much Vermilion, and Lake, temper theſe with the flat of a Knife's Blade upon your Pallet, or Hand-board, and uſe it for the deepeſt Carnation of the Face, adding moreover to a ſmall part of it more white, and reſerve that for a lighter Carnation. And yet another part being reſerved, add more white to it, till it come to the lighteſt Colour in the Face: And then proceed to prepare the faint ſhadows, and in doing it

Take

Take Smalt, and mix it with a little white, which may conveniently ſerve for the Eyes; then laying aſide the greateſt quantity, add to the reſt a little Pink, and theſe well tempered, will ſerve for the faint greeniſh ſhadow in the Face; then proceed to prepare your deep ſhadows: And in order to it, take Lake, Pink, and Ivory-black, a like quantity of each, and temper them together. And if the Face of the Party, or the Figure you are to copy require redder ſhadows, than what you have tempered, add more Lake, if yellower, more Pink, if bluer, or greyer, then add more black.

Thus having prepared your Pallet with Colours ſuitable to a fair Face; conſider again, in caſe the Complexion be more brown, or ſwarthy, you may temper the Colours, as before, putting moreover a little quantity of burnt Oker amongſt your Lake, Vermilion, and White, that it may look ſomewhat tawny amongſt your heightned Colours: In this caſe, temper a little Oker, ſo much only, as will juſt turn it, and for your very deep, and very faint ſhadows, you may uſe the ſame, as for the former Complexion.

For a tawny Complexion, uſe the ſame, in the general, as before, only let the ſhadows be prepared of burnt Oker, and Umber.

For an abſolute black Complexion, your dark ſhadow muſt be as the fore going, but as for your heightnings, you muſt take burnt Oker, Lake, with black and white, yet but a little of

the latter must be put in at first, that you may the better work it up by degrees: And note, that the single Colours laid at first upon your Pallet well tempered, according to the fore-going Directions, serve for shadows for all Complexions.

CHAP. XI.

What Pencils are to be used in painting a Face, and how to dispose them. Directions to paint a Face in Oil Colour, and what mixtures are requisite for Garments, &c.

YOur Pencils, how small soever, ought to have a stick about nine inches long, cut, or sharpened at the farthest end into a point, and when you are to draw any Face, lay together two Ducks Quills Fitch-Pencils, two Goose Quill fitch'd, two pointed, and two bristled, the pairs being exactly alike; and when you are to use them, having your Pallet in a readiness upon your thumb, take them in your right Hand, and put the ends of your sticks into your left Hand, keeping when you work the hairy ends, at a distance lest the Colours intermingle, & so proceed to your work, *viz.* your Cloth being ready primed, and strained upon your Frame, scrape it

over

over with a Knifes edge, not very ſharp, to take off the knots, if any appear, and ſo ſet your Frame and Cloth upon your Eyſel a convenient height, ſo that you ſitting upon a Stool level with the Party or Copy you draw, may the better have the Picture equal, &c. placing it according to your Light, as I have directed in Water-limning; then with a piece of Chalk draw the proportion of the Face upon the Cloth, making the place for the Eyes, Noſe, Mouth, Ears, Hair, &c. Then take a Swans Quill pointed Pencil, and begin with ſome of the lighteſt Colours in the lighteſt part of the Face (the Cloth before being primed, or ground-laid) as the heightning of the Fore-head, Cheek-bone, Noſe, &c. on the lighteſt ſide, and when you have done that, next proceed to the mean parts, *viz.* thoſe not altogether ſo light, as the Cheek bone of the fore-ſhortning, or dark ſide, the Chin and upper Lip and by degrees come to the reddeſt part of all.

Having thus far proceeded, lay the greeniſh faint ſhadows in places convenient, and where you ſee cauſe, to moderate the harder ſhadows, but have eſpecial regard not to place the green, where the red ſhould be: And ſo, all the faint, and light beginnings being put in, take a Ducks Quill fitch'd, and a Gooſe-Quill pointed Pencil, and begin at the Eyes to ſhadow with Lake, and trace out thoſe parts of the Face therewith, that require it, as the Eyes, Noſe, Mouth, the compaſs of the Ears, &c. and do this

this before you lay on any Colour, lightly wiping it over with a linen rag, to prevent theovercoming of other Colours.

Having now put in all the Colours, dark, and light, take a large fitched Pencil, and ſweeten the Colours: That is, go over the ſeveral ſhadows with a clean, ſoft Pencil, which by a gentle, and dexterous handling, will force, or drive the Colours into each other; ſo that they will repreſent the laying on at once, and not at ſeveral times. This being done, begin again with your clean Pencils of ſuch bigneſs, as the work requires; then, the Party ſitting in the poſture as before, take a curious view, and ſee what defects you find in the work, and amend them; after that proceed to heighten, or deepen your ſhadows, as the Nature of the piece requires, and if a Beard, or Hair be required, take a Gooſe Quill briſtle Pencil, and put in the Hair about the Face, and rub in the greater Hair, with the greater Briſtle, heightning it up with your Gooſe-quill Pencil, and ſo your work is done.

If Garments are required, called by Artiſts Drapery, For a red Garment, lay dead Colour with Vermilion, glaze it over with Lake, and heighten it with white. For Scarlet, Vermilion muſt be the lighteſt, deepened with Lake, or Indian red. For a crimſon Velvet, lay burnt Oker, Vermilion, or Indian red, glaze it with Lake, and touch it up with Vermilion. For a ſad red, heighten Indian red with white, and

let all your deepenings be with black, Pink, and Lake well tempered. For green Garments, heighten Bise and Pink with Masticote, and deepen it with Indico and Pink. For green Velvet, lay the dead Colour with white, and a little Lamp black, glaze it with Verdegrease, deepen it with Indico and Pink, and heighten it with Pink and white. For yellow, take yellow Oker, Masticote, and Umber, lay the dead Colour with Masticote, and white, in the highest Places, and with white, and Oker in the meanest, and with Umber in the darkest, glazing it when dry with Pink.

For blue Garments, take Indico, and white, laying first the white in its due Places; and then your mean Colour, *viz.* Indico, and white well tempered in their due places; then deepen it with Indico, and glaze it with Ultramarine when dry, *&c.*

For purple Garments, take Oil small tempered with Lake, and white Lead, and heighten it with the latter.

For black Garments, let the dead Colour be Lamp-black, and a little Verdegrease, and when it is dry, go over it with Ivory-black, and having heightned it with white, go over it with Ivory black, and Verdegrease.

For Orange Colour Garments, mix red Lead and Lake, laying the lightest parts with red Lead and white; the mean parts with only red Lead and the deeper with Lake, and if need requires you may heighten it with white.

For Cloth coloured Garments, for the ground, take Umber, and white, and for the deeper ſhadows Umber and black, and for the mean Umber and Oker, and whiten it with Oker, and white. And thus much may ſuffice for limning, and painting of theſe kinds.

CHAP. XII.

The curious and myſterious Art of etching, and ingraving in Gold, Silver, Copper, Steel, &c. diſplayed, and made manifeſt in eaſie and plain Rules, and Methods, by which an unexperienced Perſon, many attain to the knowledge thereof, and the expert be wonderfully improved, &c.

TO introduce this curious Art, I think it highly convenient to begin with etching, the better to give a light into what ſucceeds, &c. and firſt of the Ground.

In this caſe, procure three parts of Virgins wax, and one of Aſphaltum, one part of Maſtick, and one part of clarified Roſin, but all but the Wax, putting that into a new glazed Pipkin, or Pan, and let it boil over a gentle Fire, at what time, put the other Ingredients to it, which being

being melted, pour it out into fair cold water, keeping back the dregs; and when it is cold, work it into a ball; tie it then in a rag, ſo cloſe, that no dregs may come through, and uſe it upon your Copper, as you have occaſion.

In preparing your Copper, obſerve that it be well poliſhed, not lying higher in one place than another, nor no where uneven, and if you eſpy any ſpecks or diſorders in it, coal it over with a well burnt Char-coal, and fair water, and ſet it aſlope to dry, which done, ſcrape ſome very dry Chalk or Whitening upon it, and rub it over with a woollen rag, not touching the Face of the Plate with your finger, till the ground be laid, which muſt be done in this manner, *viz.*

Put lighted Small coal into a Chafing-diſh, and lay the Plate on the wrong ſide over it, that a gentle breathing of heat may come through; then take your ground in the rag, and rub it gently up and down the Copper, till it coming through the covering, by reaſon of the heat, may ſufficiently cover the Plate, not too thick nor too thin; and then whilſt it is warm, take a Duck's Feather, and ſmooth it to an exact evenneſs, but beware the Copper be not too hot for if it ſmoak, the moiſture of the ground is gone, and then in etching, it will crack, and fly up; and when it is according to your mind, ſuffer the Plate to cool; then grind a piece of white Lead in Gum-water, not very ſtiff, and make the white of convenient ſtiffneſs to waſh over the firſt ground of the Plate, with a bruſh dipped therein

therein, till you perceive it every way ſmooth, going over it with another bruſh of ſoft Furs, and ſo let it dry.

The ground thus laid, take your draught, after which, you are to work, and ſcrape on the back-ſide of it ſome red Chalk, moving it all over, and ſcrape over that ſome Small coal, very fine, ſuffering it to mingle with the Chalk; and then with a Pencil, or Hand-bruſh, rub it up and down, till it be ſmooth, and even, and ſo place your deſign upon the Plate, and with a blunt Needle, or Steel Point, draw over the outſtroaks; and then you muſt have ſeveral Needles, according to the ſmallneſs, and largeneſs of your ſtroaks in the Copy, and with them in a fin Pencil, frame, or ſtick according as bluntneſs, or ſharpneſs requires, take out all the black ſtroaks, preſſing ſo hard, that the needles may paſs through the ground, and make ſome ſmall impreſſion on the Copper, ever obſerving when you lay by your Plate, to wrap it up in a Paper to prevent ſcratches, or the Air ſpoiling the Ground, wiping away as you work the Ground the needles brake up with a light Pencil, not ſuffering the ground to lye too long on the Plate before you finiſh, for the Air drawing out the moiſture of the ground, the Etching will appear broad and deep, working of black and unſeemly; for when ſometimes you ſuppoſe it eaten ſufficiently, you will find it defective in many places, and in frofty weather you muſt wrap the plate as well in a blanket as in a Paper, for if the froſt

take

take the Copper, the ground will ſtart from it, and ſo the Aqua-fortis will ſpread under it, and keep no certain form.

Having obſerved theſe directions, take green Wax, and melt it in a new Pan, or Pipkin, and with a Pencil cover the edges of the Copper and ſtick the Wax round about like a Wall, to keep in the Aqua-fortis; that done, which being firmly ſtuck on, take the third part of an ounce of Aqua-fortis, and break it with other Water of the ſame kind, that has been once, or twice uſed, taking at leaſt two parts of the old, to one part of new, and in caſe, you have no old Aqua-fortis; then inſtead of it, uſe ſtrong white-wine Vinegar, as a mixture; and for ſuch Figures, or things, as you would have lye fine, and ſweet, you muſt pour out your Aqua-fortis into ſome Earthen Veſſel; and then waſh of what remains with fair water, and ſuffer it to dry; then melt Candle-greaſe, with a little ground, and with a Pencil cover the Places you would have lye faint; then pour on again your Aqua-fortis, and ſo continue to do, as often, as you can conceive it convenient; then melt off the ground over a gentle Fire, and with a clean rag, wipe it off, and you will have the perfect impreſſion of the Copy on the Plate, which you may work off at the rowling Preſs, to ſerve your occaſions, and thus you may do upon any metal the water will take, &c.

From etching, I proceed to the Art of engraving, and he that would be expert herein, muſt have

have a regard to true drawing; wherefore, I would adviſe the unskilful well to conſider what I have laid down of that kind, and ſo provide himſelf with materials for the performance of this curious Art.

In the firſt place, be ſure to chooſe a good Oil ſtone free from pin holes, or flaws, not too hard, nor too ſoft; and therefore the better to furniſh your ſelf aright, you muſt conſult, in what the ſtreſs of your buſineſs will lie; for if you intend Picture, or Letter work, accounted more curious than Marks, or Arms uſed by Gold-ſmiths, and Pewterers, you muſt have your Gravers accordingly ſhaped, and tempered, for Gold-ſmiths, &c. Gravers are frequently crooked, the better to come at hollow places, &c. but for Copper, or any Plate, that may be eaſily come at, the ſtrait Gravers are ever held the beſt, and if you ſuſpect their goodneſs, try whether, or not, they are file proof; and if ſo, they will fit your purpoſe, though at firſt, by reaſon of their temper, they may appear brittle, and ſometimes break ſhort, yet being ground out, they will ſtill grow better and better, and come in a little time to an excellent temper.

As for the forms of Gravers, as to their uſe, the ſquare one makes a broad ſhadow ſtroak, or hatch and that which is, form Lozenge, a narrow deep one, the one being appropriated to large, and the other to fine ſtroaks, yet if your work be curious, a middle ſize between theſe will the better accomodate you, which will render

your

your ſtroaks, or hatches more graceful, and yet carry with them ſufficient force and vigor.

In caſe of whetting your Gravers, which is frequently required, pour a little fine Olive Oil upon your ſtone, and laying that ſide, which you intend ſhall cut the Copper flat upon it, whet it very flat, and even, and to that purpoſe, carry your hand very ſteady, continuing an equal ſtrength, and placing your fore finger firm upon the contrary ſide, ſo that you may have more power to guide it with exactneſs; then turn the unwhetted ſide, and uſe it in the ſame form and manner, that there may be a very ſharp edge; then turning uppermoſt that edge, which in the former manner you have whetted, ſetting the end of your Graver obliquely upon the ſtone, bear your hand with an exact evenneſs, to the intent it may prove very flat, and ſloping in the form of a Lozenge; and in this, you muſt take great care; for if your Graver be not well, and rightly whetted, you can never grave well.

Obſerve, when you have a Graver, whoſe handle is a round, or oval knob, if you would prevent it from running into the Copper, or other metal you grave, further than is convenient, then muſt you cut off that part of the knob, which lies in a Line with the point of the Graver, and make it as level as you can with the point, nor then will it hinder your Hand from carrying an even ſtroak, which otherwiſe it will do, eſpecially in working a great Plate, by bearing too much upon the Copper, and in holding

ing it, place the knob-ſide, or that part of the Ball not cut off in the hollow of your Hand, extending your fore-finger towards the point, and laying it oppoſite to the edge, that is to cut, and place your other fingers on the one ſide of the handle, and your thumb on the other ſide of the Graver, in ſuch a manner, as with eaſe you may guide it flat and parallel with the Plate, being ever very careful, that you fingers do not interpoſe between the Plate, and Graver, leſt it hinder you in carrying it level with the Plate, hindering you from making your ſtroaks with freedom, and neatneſs.

Further to fix you in this affair, you muſt have a ſtrong round Cuſhion of Leather filled with fine Sand, about half a foot over, and four inches in the Diameter, riſing a little in the middle, and ſloping towards the brims, but not much, and this muſt be to lay your Plate on, that you may turn it at leiſure; and if you are to make ſtreight ſtroaks, hold your Graver in a direct Line: Or in caſe you would have your ſtroaks broader, and deeper in one place than in another, you muſt lay more or leſs ſtreſs, as you ſee occaſion, obſerving in all ſtreight ſtroaks, to hold your Plate ſteady, and firm upon the Cuſhion, and the Table, or Bank on which it ſtands well fixed: But in crooked, and winding ſtroaks, you muſt hold your Hand, and Graver ſteadfaſt, and only turn your Plate, or otherways you cannot command your Hand to that neatneſs, as in many caſes is required, obſer-

ving at the same time, for the more steadiness to keep your Elbow fixed upon the Table, and your Eye on the Plate, scraping your work, as you go with the edge of a burnisher to take off the roughness; yet be careful that you make no scratches, and the better to see what you have done, rub the place over with a piece of black felt dipped in Oil; and then if any scratches appear, with your burnisher rub them out; and if any stroaks be too hard, in the same manner you may make them fainter. And in case your Graver should happen to appear very hard, which by its excessive brittleness in often breaking is known, lay it upon a burning Charcoal, till it grow yellow; and then dip it in water, and it will by often so doing render it of a better temper, but if it be blunt in a short time cutting, then it is too soft, and you must heat it in the fire, and dip it in Lime juice, or Vinegar: And thus much for the management of the Tools, &c. the which by a little practice will soon grow natural.

Another material thing in Art is to be considered; which is, to take the Impression you are to cut or grave upon your Plate; and in this case, heat your Plate over a fire of Small-coal, and having a piece of fine Bees-wax tyed up in a fine rag, worked like a ball, that it may sit close, wipe the Plate over with it, when it is hot enough, very lightly, till you perceive it is covered with wax, very thin, and even, laying it with a feather; in which, at first you may find some difficulty, but use will render it easie

and in this case, if you are to imitate an exact Copy, it must be so ordered, that it may stand the contrary way on the Plate; and therefore in consideration hereof, your best way will be to trace it over with a black Lead Pencil; especially in case of a very old Picture, which being done, take a piece of polished Ivory, and placing your Picture exactly on your Plate, the Print side downward, rub it lightly, and you will perceive the exact proportion of the Print remaining upon the Wax, or the Plate; then take a steel point, and go over each particular Limb, &c. especially in the out stroaks, and there will be but little difficulty to mark the shadows which lie before you, as you engrave the Work, and the readier it will be, if so you note how far your shadows should be dark, and how far light, with your black Lead before you rub it off.

The carrying of the hand in this kind, will at first seem difficult, as to the depth of your stroaks; but in general, observe ever to carry your hand with such a slight, that you may end with the same faintness, or darkness you begin: And in case, one part require more deepness, and blackness than another, you must do that by degrees; and that you may the more expertly do it, observe that your stroaks be not too close, nor too wide; and therefore to bring your hand in the better, practise at first by such Prints, as are but loosly shadowed, least by attempting to imitate those more dark and close, you happen to be puzzled where to begin, and

where to end, but practice will inform you.

As for Letters; in case of Copies, the Letters must be gone over with ungumed Ink, or with black Lead, and laid on the Plate when waxed as the former, unless you are so dexterous at writing, that you can draw them by hand, or with a steel point on the Plate in true Cut, &c.

But if a Map, or other Mathematical Instrument be required, every circle, or perpendicular must be drawn over as before, or you cannot exactly imitate. But in case of a face, or coat of Arms, or Instruments not to be printed; then you may black over the back-side, as in etching, but you must use for engraving a wax ground only.

CHAP.

CHAP. XIII.

The Mystery of cutting in Wood, laying Gold, or Silver, solid, or liquid, preparing Colours for the painting of Pictures, or Prints, the way of refreshing old Paintings, or Pictures; colouring Maps, Buildings, Landskips, and many other curious things, and matters.

As for cutting in Wood, in relation to Pictures or the like.

YOU must prepare your Wood in the manner of a Plate, though an Inch thick, or according as the design requires, either Box, or Pear-tree, rendering it by plaining as smooth, and level as a piece of Paper; which done, having a draught of your design, you must rub the Wood gently over with a ground of paste made of the finest flower; and then fix your draught, or copy upon it, when suffering it to dry, rub the back side of the paper, which must be uppermost, with your wet finger, till you crumble it off so thin, that the Print plainly appears upon the Wood, as if it had been painted, or drawn thereon with a pen, or pencil.

Having thus prepared your Wood, if it be small, fasten it up with coins, that it move not, unless there be occasion, or as the stroaks re-

quire; and then having a fine ſmall knife in the nature of a Pen-knife, but much leſs and thinner, eſpecially for the fine ſtroaks, cut out all the white ſtroaks, and ground, and ſuffer the black ones to ſtand, ſharpening the fine ſtroaks, and bringing them to an edge, that they may not print black, or dull; and above all, be ſure to do it with ſo light, and curious a hand, that you break none of them; for if ſo, you much deface, and injure the Work, they not being to be repaired; and further obſerve to leave a good foundation to the ſtroaks, though never ſo fine at the top, leaſt by the force of the Preſs, they break in working.

You may have your Pattern, or Advice, if it be new drawn upon the Wood with black, or red Lead, though the former way is the ſecureſt from being rubbed out, or injured, &c.

To write, or gild with Gold, and Silver, an eaſie, and curious method, &c.

If you would have fair Letters appear in Gold, or Silver, take Gum-armoniack, and grind it with a little juice of Garlick, and put thereto a few drops of the weak water of Gum-arabick; and ſo make it to the thickneſs of Ink, that you may conveniently write with it; and ſo write, or draw what you think convenient, and ſuffer it to dry a little, but not too much, leſt it take not the Gold, or Silver, nor too little, leſt it drown them. Then lay your Gold, or Silver in Leaf upon

upon a Leither Cushion, being a piece of Calves skin stuffed, with the rough side outwards; and so with a sharp knife, cut it into what proportion you will, suitable to what you have written, and taking it up with a loose piece of Cotton Wool, on which you have breathed, cover with it the place intended, pressing it down hard, and where the Gum-water is, it will take it; then brush away with other Cotton, what it has not taken, and being dry, burnish it with a piece of polished Ivory, and it will appear very splendid.

To write, or gild with liquid Gold, or Silver, &c.

Take shell Gold, which is made of the raggid edges, or cuttings of Leaf Gold; and when you are desirous to use it, put in a little fair water, tempering it up with a clean Pencil, and lay it on with a Pen, or Pencil in what form you please, either by way of writing, or gilding; and when it is dry, rub it over with a Dog's, Cat's, or Horse's Fore-tooth, and it will be very shining, and pleasant. And of this, as of the former, you may lay on more, or less, either for the gilding Picture Frames, Coaches, Rooms, or the like. As for lacquering, it only consists of carrying a Pencil dipped in rectified Spirits over Leaf Silver, which changes it to a gold Colour.

How to prepare Colours to colour printed Pictures, and thereby render them beautiful.

For a curious Violet Colour, take Turnſole, being a dye infuſed into a piece of a linen rag, heat it in Vinegar, and it will give you the Colour deſired, after which diſſolve in it ſome Gum-arabick, and uſe it, as you ſee occaſion.

For a curious yellow, take Gum-booge, and diſſolve it in fair Spring water over a gentle fire.

To make a tranſparent red, take Braziel, grind it, and heat it over a Fire, with ſmall Beer, and Vinegar, put in a little Powder of Alum, and Gum-arabick, and ſuffer it to boil, till it taſte ſtrong, *&c.*

For a tranſparent purple Colour, grind Log-wood, and boil it in all reſpects as the former.

For a curious blue, take fine Litmos, and cut it into ſmall peices, lay it for the ſpace of twenty four hours in a weak Lake, Gum-water; to make which, you have been before directed, and it will anſwer your expectations.

To make a curious green, take the juice of rue, and a little Verdigreaſe.

For a light green, take Sap green flower de Biſs, or tawny green, and ſteep them in fair water.

To

To ſhadow greens, ſteep Indico, and yellow Berries.

To ſhadow blues, take Litmos, and Indico, ſteeping them in the Lees of Sope aſhes, and uſe them with Gum water.

To make a good brown, take Ceruſe, red Lead, Pink, and Engliſh Oker, mixing them, with Gum-water.

For an Orange Colour, take red Lead, and yellow Berries, and mix them with Gum-water.

For a curious fleſh Colour, take white Lead red Lead, and Lake with Gum-water.

To make a Colour for precious ſtones, take Verdigreaſe, and Varniſh for an Emrald, Florence Lake, for a Ruby, and Ultramarine, for Sapphire.

How to colour Maps, and what is to be obſerved therein.

In this caſe as well as in other printed Pictures, is no more than to ſet them out in their proper Colours, which you muſt accordingly conſider, as the nature of the thing requires, it being impoſſible to direct in particulars; however obſerve that water muſt be a faint blue, Sky ſomewhat deeper, Trees green, Houſes in Maps are uſually red, and ways yellow, and green: And to theſe, and the reſt, ſuit any water Colour, you think ſuitable mentioned in this Book.

Colouring for Landskips, and building at large, very proper.

In Landskips, for the saddest Hills, use burnt Umber, for the lightest, put some yellow to it; and for other Hills, lay Copper green thickened on the Fire, or in the Sun; and for those further off, mix with it some yellow Berries, and let the fourth part be done with green Verditer; and the furthest, and faintest Places with blue Bise, for the lightest places, use white, and shadow it with blue, as for the High ways, do them with white, and red Lead, using for Variety yellow Oker, shadowing it with burnt Umber; and it may likewise be used for sandy Rocks, and Hills; and as for other Rocks, you may lay them with several Colours; but at a distance, they must appear blue, as in the Air; as for the water, do it with black Verditer, and white shadowed with green, and with blue Verditer, when the banks cast a green shadow upon the water; but when the water is dark in the shadows, shadow it with Indico, blue Verditer, and green, &c.

How to colour Building, &c.

In colouring Buildings, you must use much variety the better to set them off, yet not so, as they may appear extravagantly adorned, or contrary to the use of this kind; but for Walls, and Con-

duits, uſe a mixture of white, and black; as likewiſe for other materials, but if a Brick-houſe, uſe red Lead, and white, and where the Houſes ſtand thick together, there uſe ſundry Colours ſuitable to the occaſion.

To cleanſe old Pictures, and render them fair and pleaſing.

Take Wood-Aſhes, the whiteſt that may be had, ſift them through a fine lawn ſieve, and with a Spunge, and fair water, waſh the Picture gently over not rubbing it hard, leaſt you impair the ſhadows, which being done, and the Picture dry, take diſtilled Varnith, and rub it thin, and gently over, and it will create a laſting freſhneſs, or for want of this, you may do it with the whites of Eggs exceeding well beaten, or with Gum-water: But note, the Pictures to be thus uſed, muſt be ſuch as are laid in Water-Colour Oil.

CHAP.

CHAP. XIV.

Inſtructions for reſtoring Tapeſtry Hangings, Carpets, or Turky Chairs, that are faded, or decayed, to their lively Colour; to prepare Flock Cloth for Hangings; Spaniſh white, Size, Alum water, and Gum-arabick water, how to make them; as alſo to thicken Cloth for Screens, &c.

To refreſh Hangings, or Tapeſtry, Carpets, or Chairs,

BEat the duſt out of them in a dry day, as clean as may be; then rub them over well with a dry bruſh, and make a good Ladder of aſteel, or Cake Sope, and rub them well over with a hard bruſh; then take fair water, and with it waſh off the froth, and make a water with Alum, and waſh them over with it, and you will find, when dry moſt of the Colours reſtored in a ſhort time; and thoſe that are yet too faint, you muſt touch up with a Pencil dipped in ſuitable Colours; and indeed you may run over the whole piece in the ſame manner, with water Colours mixed with weak Gum-water, and it will cauſe it, if well done, to look at a diſtance like new.

To

To make Flock Cloth Hangings, &c.

To do this, take a courſe Canvas, ſpread it even upon a Flour, or Table; then take flocks, or ſhreads of Woollen, grind them as ſmall as duſt, and having ſized over your Cloth with a good ſtrong ſize, ſift whilſt it is wet the flocks on through a ſieve very fine, and having done it even in all places, run a rowler of wood, or Iron over the piece to preſs them down cloſe, and ſo ſuffer them to dry in the ſhade, leſt the Sun, or Fire parch, and make them crack, and when dry, bruſh them lightly over with Alum-water; and ſo draw your deſign with black Lead, red Lead, Charcoal black, or any other Colour you fancy, and it will at a diſtance look like Tapeſtry, and be very laſting in a room, where no great Fires are made.

How to thicken Linen Cloth for Screens, Bed-teasters, and the like.

Grind whiting with ſize, and to prevent its cracking, add a little Honey to it; then take a ſoft, and ſmooth bruſh, and lay it upon the Cloth, and ſo do two, or three times, ſuffering it the mean while to dry between layings on, and for the laſt laying, ſmooth it over with *Spaniſh* white laid with Line-ſeed Oil, the Oil being firſt heated, and mixed with a ſmall quantity of the Litharge.

Litharge of Gold, the better to endure the weather, and so it will be lasting.

Spanish *white, how to make it.*

Take fine Chalk, with a tenth part of Alum, grind them with fair water, till very soft; and then bring them to a thickness, and make them up into Balls, lay them to dry leasurely; and then heat them well in the Fire; and so use them.

To make a very good Size useful upon sundry Occasions, &c.

Take glue a pound, steep it in four gallons of water, till it be dissolved; then take a pound of the shreds, or cuttings of Gloves, or other the like Leather, and boil them in the water, wherein the glue has been dissolved over a gentle Fire, till it feel very clammy between your fingers, and when that is done, strain the liquid part through a sieve, and keep it for your use.

To make Alum water the best way.

Take a pound of Alum, bruise it, and put it into two gallons of water, adding a small piece of Gum arabick; and having scumed it after a gentle heating from the froth, or scurf, strain the water, and keep it for your use; and especially, to

wash

wash over printed Pictures lightly before you paint, or colour them, by which means, they being afterward suffered to dry, the Colour will be prevented from sinking, or soaking in unseemly.

To make Gum-arabick water for all Occasions.

Take of the transparent, or white Gum two ounces, half an ounce of Alum, and two quarts of Spring water, dissolve the former in the latter over a gentle Fire, scum it, and take away the dross; and so use it with Colours, or in making Ink, or the like, and if you perceive it too strong, you must put more water; but if too weak, then more Gum, taking out the dross as before.

And thus much may suffice for the first part of this Book, and past all peradventure prove useful to the Reader, and Practitioner, in such a manner, that I can scarcely believe he ever will, or at least will never have cause to repent of, or repine at the cost, and labour so necessary a Treatise, fill'd with so much variety puts him to.

The End of the First Part.

Art's

Art's Treasury, or a profitable, and pleasing Invitation to the Lovers of Ingenuity, contained in many rare, and extraordinary Experiments, and Inventions, &c.

CHAP. I.

Metals, and Minerals, their Quality, and Generation, from what they proceed, and how produc'd, the Art of transmuting, and making artificial Metals, or Minerals, with other material matters.

IN case of Minerals, and all things inanimate, concenter'd, or contained in the Bowels of the Earth, it is convenient to reduce them to four kinds of Mixtures, viz. Metals, Stones, Earth, or Juices, Nature producing them with mixture, and participation of each other, and here by Earth, I mean the simple Element only, of which, as the Philosophers affirm, all sublunary Bodies are compounded, and though the Earth, accord-

according to the situations of Countries, and differences of Climes, differs in Scent, Colour and Taste; yet that proceeds from a mixture of some other part, or effect of the former; the pure Elementary Earth being in all places one and the same; in which, and by the operation of heat and moisture, the others are generated; and as there are more or less of these, the Metals are finer or courser: But to come nearer to our purpose.

Gold is found in Grains, or Sand; and Silver in veins, and sometimes twisted, and wreathed like the branches of a Vine; and at other times these Metals are found in stones, with whose hardness, they have incorporated themselves, and being broken, are with fining materials extracted. As for Gold; it is the most perfect of all inanimate bodies, and has its Generation, as I have said from heat, and moisture in the Original; but of Parts so well contracted, and compacted by Concoction, that it is in a manner incorruptible, it being beyond the Power of any Element to prejudice, or destroy it; for the Fire of the most subtle, and piercing Quality, consuming all other Metals by long Application, renders Gold more pure, nor can the Air, Water, or Earth diminish its luster; but that it will again recover it, by which means, it has deserved the Estimation the World affords it; and is so ductil, that being expanded, an ounce of pure Gold will cover a place of twenty, or thirty feet square.

Silver

Silver as is hinted, carries a fineneſs next to Gold, wanting little more than the Colour, to be brought to its perfection; wherefore thoſe that ſtrongly inveigh againſt the tranſmutation of Metals, have been convinced, that there is a poſſibility to turn Silver into Gold, by reaſon Fire and artificial concoctions may ſupply the defect, of which there have been many Experiments, and from the even mixture, good temperature, and fineneſs of its parts, it is not only ductil, and malleable, but endures the Fire with little waſte, and admirable it is, that an ounce of fine Silver may be drawn out into a thouſand four hundred yards, and that too, for the moſt part without breaking; and all this extenſion may be gilded with ſix grains of Gold.

Copper is a metal to the compoſition whereof, a great quantity of Sulphur is required, and from a diſtempered heat in the mixture, the fiery heat proceeds, and being over burnt in its compoſition, it is therefore leſs ſubject to Corruption, and is uſed about Engines of long continuance, becauſe it ruſteth not, and is found in Mineral Stones of divers colours, though the moſt effectual Colour is green, or blue, and ſo often is it ingendred near Gold, and Silver, that many times following a vein of it, much pure Gold, and oftener Silver has been found; and ſuch Veins of Copper, as make a ſuperficial ſhew, are upon being digged, richer, the deeper you go, and that is occaſioned by the moiſture; and many times pure Silver is at the bottom, &c.

Iron

Iron though very common, which leſſens its eſteem, and may be termed the Wall, and Bulwark of Kingdoms the ſafe-Guard of private Perſons and the Handy-craft Tradſman's only *unum neceſſarium* for without it few Imployments can ſubſiſt. As for its extraordinary hardneſs from over much Earthy parts, or fixed Sulphur in its compoſition; not, but it has a proportion of Quick ſilver in it, ſo that it will not without a very violent heat be melted, nor will it break, but expand by force of hammers, or other Violence, and receive an impreſſion by dilating itſelf; and although it is cold and dry, yet by reaſon it is more porous than other Metals, it is of leſs weight; and conſequently ſubject to be conſumed by ruſt.

Lead is frequently found in the Silver Mines, and indeed as often by it ſelf, nor ſcarcely is there any ore, but ſome quantity of Lead is found in its mixture, as being by the abundance of its humidity ſerviceable to it; and eſpecially in the melting of Gold, and Silver, which cannot conveniently be done without the help of Lead; for in this caſe, by reaſon of its moiſture, it does eaſily evaporate, carrying with it whatever is not Gold, or Silver, and in its weight comes neareſt to the former, *viz.* Gold, and in Colour to Silver, not being ſubject to Corruption, as Iron.

Tin is begotten, or generated by a groſſer ſort of indigeſted Quick ſilver, though much finer than Lead, by which means, it becomes more

White

white, and hard, though from the ill mixture of its ſubſtance, it is accounted the Bane of Metals making them brittle by never ſo ſmall a mixture; and the reaſon is, that by its incorporation, it hinders the ductility, and diſorders its former equal temperature; except in Lead, with which it better agrees, by reaſon of the moiſture, and ſoftneſs; ſo that being incorporated they become ductil, and malleable.

Quick-ſilver is of a liquid penetrating Subſtance, and greatly in uſe; eſpecially in refining Metals, agreeing with any ſort, abounding with much humidity; which gives it brightneſs and weight, and is held the principal of the Generation of all Metals; nay its very ſubſtance is tranſmutable into Metals, enduring as well, as thoſe that come out of the Mines, the trial of the Fire, and Hammer.

There are ſundry Metals, called Artificial Metals, made by mixture of Minerals. As from a mixture of Tin, and Copper, Braſs, or Bell-metal is made; as alſo for pieces of Ordnance, and ſundry other uſes: and in this caſe, a pound of Tin muſt be put from four, to eight pound of Copper, according as you expect it brittler, or tougher.

Latten is made of Plates of Copper, put into Cruſibles, and covered with Powder of Lamina, or a kind of half Mineral Sulphur ſtrewed over it, and upon that, the Powder of beaten Glaſs, to which, Fire being put, and the ſteem, or greateſt force of it kept in, it alters the

the Colour of the Copper to a braſſy quality, and adds in weight eight pound to the hundred.

Pewter, a mixture of Lead, and Tin, and has ſometimes in it, for the better hardning, and keeping it together, a ſmall quantity of Braſs, or Copper: And thus much for the Generation, and Deſcription of Metals, which the Earth ſo abundantly produces for the uſe, and benefit of Man-kind, from whence I proceed to the hardning of Metals, for Handy-craft, and ſundry other uſes.

CHAP. II.

Inſtructions for ſoftening, and hardning Metals, and Minerals ſuitable to ſundry occaſions, as uſing in Tools, Engraving, &c. *The Art of ſoldering, and gilding, burniſhing, and the like, upon Metals*, &c.

To ſoften Steel, or Chryſtal.

TAke of unquenched Lime a pound, and as much of Soap-boilers Aſhes, and having made a Ley therewith, put your Steel, or Chryſtal into it for the ſpace of twenty four hours, and

and it will easily be cut, or other ways ordered, &c.

To soften brittle, and stubborn Iron.

Take the juice of Colts-foot, and Hemlock, and when your Iron is hot, steep it therein, and it will become ductil, or you may do it by often quenching in Line-seed Oil.

How to make a Powder to soften Metals.

Take your Metal, and heat it well, then take ground, or beaten Glass, common Salt, and Brimstone, and sprinkle them upon your Metal, whilst it is red hot, and afterward burn them off in the Fire.

To make Iron, or Steel, as soft as Copper the better to ingrave upon, &c.

Take Chalk, and Alum, bruise them well together, and being wet with the juice of an Onion, dawb it over your Metal a finger thick, and thrust it into the Fire, suffering it to burn, till it become clear, and it will answer your expectation.

To make Iron, or Steel so soft, that you may temper it at Pleasure.

Take the Gall of an Ox, mix it with Oil of Turpentine,

Turpentine, and Urine, heat your Metal, and ſtrow upon it Powder of Vitriol; then waſh it over with the materials before mentioned, till it comes to be ſomewhat cool, and it will be very flexible.

Inſtructions to harden ſoft Iron.

Take the concoction of Vervein, Houſleek Juice, the juice of Hore-hound, Radiſh, or Rue, diſſolve in them ſome Alum-powder, and the buſineſs will be effected, if you anoint your Metal when hot with the liquid part.

To harden all manner of Iron Tools, or Inſtruments.

Take the Leaves, or juice of Pentefole, or five leaved Graſs, the juice of a Limon, or White-wine Vinegar, and dip the pieces of Metal, or Tools in it, when hot; and do ſo often, and you will find the advantage.

To make Iron as hard as Steel.

Take the juice of Roman Nigrel, and Moule-ear, herbs ſo called, and ſtrike over the Metal being hot; and by this means Tools may be made of it that will cut Iron.

To

To harden Metal, so that it shall not crack, nor flaw, &c.

Take Oil of Spike, and Mutton Suet, and dawb over the Metal hot; then plunge it suddenly in cold water, and the business will be effected.

To harden Augres, Files, Chizels, Mattocks, &c. for use.

Take the Juice of Radish, or Cole-worts, mix it with Ley made of Soap-ashes, heat it over the Fire, and when your Tools are well heated, or red hot in the Fire, quench them in it.

To make Tools so hard, that they will cut Iron, Copper, &c.

Take Salt Peter, and Copperas, strew them in Powder upon the Tools, when red hot; and then quench them in the destilled water of Shell-snails, and your expectation will be answered.

To colour, or varnish Tin, Copper, or the like metals.

Take half a pint of Line-seed Oil, warm it over the Fire, and scum it; then put therein bruised Amber, and Aloepaticum, of each a quarter of an ounce, and suffer them to boil up to the

the thickneſs of an Ointment; after that, ſet them in a cloſe earthen Veſſel under ground for the ſpace of four days, and when you uſe it, ſtrike over your Metal with a bruſh, or Pencil, it being at the ſame time hot over a pan of Small-coal, and it will be of a curious Amber, or golden Colour.

The manner of gilding upon Metals, viz.

Take Wine-ſtone, Verdigreaſe, and Sal-armoniack, ſeeth them in White-wine with ſome common Salt, ſtrike over the Metal indifferent warm with the liquid part, and ſuffering it to dry a little, take Water or Leaf Gold, and lay it on, which by the Virtue of the waſhing will ſtick faſt; ſo that with a burniſher of Ivory, you may finiſh it in its proper Luſter.

How to make a water for the gilding Metals.

Take three pints of Spring water, two pound of Roch Alum, an ounce of Roman Vitriol, and as much Verdigreaſe, and Orpiment, boil, and ſcum them; and then put in water of Tartar, and Bay Salt, of each two ounces; and when the Ingredients are well diſſolved, and come to a thickneſs, ſtrike over your Metal therewith, dry it againſt the Fire, and burniſh it.

How to gild Iron, or Steel with Quick-silver, and Gold Foil.

Take Vitriol, and Sal-armoniack, of each an ounce, and of Alum two ounces, beat them fine, and boil them to a thickneſs in fair water; add a dram of Verdigreaſe, and half an ounce of Sublimatum, and ſperce over your Metal with it, when having mixed your Gold, and Quick-ſilver together, lay them on with a Leather Spatula, as ſmooth, and even as may be; then ſuffer the Varniſh to take it, and burniſh it over.

To make Iron, or the like, a curious blue, or Steel Colour.

Burniſh your Metal to a brightneſs, and take Cows-hoofs, burn them, and hold the Metal over the ſmother, or ſmoak of it, and it will anſwer the end deſigned, *&c.*

To make Copper, &c. a Silver Colour.

Take Bay-ſalt, Alum, and Wine-ſtone, grind to Powder, adding in your grinding ſome ver, and put them into an earthen th your Copper amongſt it, r over with ſome

then..
leaves of S..
pot, cloſe ſtopped w..
and then taking it out, rub it
the Powder, and burniſh it.

A very good way to burnish Iron, or other Metals.

Take of Aloepaticum, Citrinum, and Amber, each an ounce; make them into Powder, and place them over a gentle Fire in a well glazed pot; and when you perceive it melted, put to it a quantity of scalding Oil; and when the mixture is well made, let it cool; and so your Metal being glowing hot, lay a little piece upon it, and rub it over.

To make a good solder for Iron, or any hard Metal being cold.

Take of Sal-Armoniack two ounces, two ounces of common Salt; the like quantity of Wine-stone in Powder, six ounces of thick ground Glass, two ounces of Clock-spike, bruise and mingle them well together, and so put them into a linen Cloth, and suffer the Cloth to be laid a finger thick with soft Clay, encompassing it on the out-side, and put them into a well glazed earthen pot, with a lid, or covet, and put that into another larger pot of Earth well covered, and suffer the two to stand over a gentle Fire, that the head may not be by degrees, and all the red hot, and drie, then suffer it to cool, and break it small, and grind it to Powder. Then in case of soldering, make your Iron, &c. fast, and the joints close laid, lay a paper under it

them, and upon it ſome of the Powder; as alſo between the Joints; then wrap it round with Clay; except the upper part, which you muſt leave open to ſolder at; then take the Powder of Burras, and put it into Wine or Aqua-vitæ, and ſuffer it to diſſolve, when dipping a feather therein, ſtrike over the upper part of the Joints, and it will begin to ſmoak and hiſs; the which ended, you may uncaſe it, and find it perfectly ſoldered.

A way to ſolder warm, or rather, hot on Iron, Steel, &c.

Take Gum-water, beat it up with green herbs of any kind, till it become a Paſte, or of that thickneſs, and ſtrike it on your Metal, or lay it on the Joint rubbing Soap over, at what time heat it, and it will prove a good Cement, *&c.*

To ſolder on copper, &c.

Take of Copperas an ounce, half an ounce of Orpiment, or white Arſnick, dividing it into two parts; and then make your Copperas run with Fire, then add one part of the Arſenick, or Orpiment; and after you have ſpread it thin on a fine ſtone, add the other part; then beat it into Powder, and uſe it as the ſolder for Iron, *&c.*

To ſolder Latten, a Metal, or mixture of Metals ſo called.

Take a File, and make the parts to be joined very ſmooth; then put them together, and being hot, ſcrape your Powder of Burras, and keep it cloſe till cool, and the Joints will be faſtened, or fixed.

To varniſh like Gold on Tin, Silver, or Copper, &c.

Take an earthen Pot well glazed with a cloſe Lid to ſhut in; and put into it ſix ounces, or half a pint of Lin-ſeed Oil, an Ounce of Aloe-paticum, and the ſame quantity of Maſtick, make them into a fine Powder, and put them into the Oil, and cover the former pot with a bigger; the firſt having a ſmall hole in the top through both lids, the better to ſtir the materials, and having cloſed the outward pot about with Clay, and ſuffer it to ſtand over the Fire, till it boils up to the hole, then cool it; and when you would experiment it, poliſh your Metal, and ſtrike it over the Metal, being indifferently warm; and ſo do it over twice, ſuffering it to dry between either time, and the buſineſs will be effected.

To lay Gold on Iron, a brief and caſie way.

Take liquid Varniſh one pound, and of Oil

of Lin-seed, and Turpentine, each an ounce, mix them well together over a gentle Fire; and lay them as a ground whereon to gild with Leaf Gold, &c. laying the Varnish very thin, and suffering it to dry.

Another easie way to gild on Metal, &c.

Take of Gum-arabick, and Bole-armoniack, each an ounce, put them into an earthen pot with a good close cover, set it over a gentle Fire; and when they are warm, put in two ounces of Lin-seed Oil; and when they come to a Varnish thickness, lay them for a ground as the former, and on them the Gold, &c. observing for the better splendor, when it is dry to polish it.

CHAP. III.

Valuable Metals, their fineness to be known by essay of Coins, and how they are to be known in their true Value; and what is to be observed in preventing your taking false moneys.

HAving briefly run over sundry matters relating to Metals and Minerals, I now proceed to come somewhat nearer their true value,

as

as by the rules of Art, they are laid down by curious Inquirers into those Affairs, &c. especially as to what relates to Metals, used in Vessels of value, and current in Coins, &c. the principal, I take to be Gold, and Silver; the rest being vulgarly known, and therefore not requisite to be mentioned in this Place.

As for the weight used for these fine Metals, it is that of *Troy*, consisting of twelve ounces; and the ounce of a hundred and fifty Carots, and may again for the deciding of lesser values be devided into four hundred, and eighty Grains; as for the Pound *Troy* weight of fine Gold, it is worth thirty six pounds, and so lessens in proportion of Allay; in this manner, *viz.* an ounce of fine Gold is valued at three pounds; and that of thirty three keys fine, at two pounds seventeen shillings six-pence; and so lessening, *viz.* twenty two Keys, at two pound fifteen shillings; twenty one Keys, at two pound twelve Shillings six pence, at twenty Keys, two pound ten shillings, loosing two shillings six pence *per* ounce, as a Key, or Carot is wanting in the fineness of twenty four.

In this case, to know the fineness, or defect, it must to prevent defraud be found out by the allay, which upon the touch-stone may be done by way of Essay in this manner, *viz.* take Needles of Gold, and Silver, and Copper allays suitable to the several allays, and suffer these to be of four sorts, *viz.* the first to be of fine Gold, and Silver: The second of Gold, and Copper.

The third of Gold, Silver, and Copper. And the fourth of Silver, and Copper only; the first for the trial of Gold; and the latter for the trial of Silver, making of these mixtures twenty four Needles of sundry finenesses. As first of fine Gold of twenty four Carots without Allay. The second twenty three Carots of fine Gold, and one of Silver. The third twenty two Carots of Gold, and two of Silver; and so proceed to one Carot worse, till there remains but one Carot of the fine Gold in mixture with the other Metals specified, *&c. viz.* twenty three Carots of Silver, and by the same rule proceed to the Gold and Copper, and Silver and Copper, marking each Needle for the better distinction upon occasion of what fineness it is; and by this way, you may be satisfied of the fineness of any Ingot, or piece of Gold or Silver in Coin or otherways by comparing them on your Touch-stone with the Needles, whose allay you already know, or trying them, till they become equal or alike, which when wetted will plainly appear. As for the value of Silver, that which is fine is accounted five shillings two pence of our Money the ounce, though there is some that will fall out in fineness, to be worth five and eight pence, and the like. But these Essays not being to be done by every Person who receives Money; I shall by other ways instruct them how they may detect counterfeit Coins.

Paſt doubt, few that have the handling of Money are ignorant, that Coins of all ſorts have been counterfeit, ſome by imbaſing in mixture, others by corrupt Metals, and other by way of plating; and to know theſe; in caſe of Guinneas or broad Gold, Firſt, weigh them, and try them by Eſſay as aforeſaid; and then if you further ſuſpect them, try them by Fire, or by Aqua fortis; and if they be of baſe Metal, or corrupted with is, they will ſoon grow dim, and their Luſtre in a ſmall time more and more impair; but if you ſuſpect them plated, eſpecially Guinneas, throw them indifferent hard on the edge, and the Imboſsment will open, and you may diſcover the ſhell to riſe. In caſe of gilded Shillings, though they have the Scepters as Guinneas, which ſome Perſons have had the Art to place there with graving Tools; yet your beſt way is to try them by racing with a Pen-knife point in any convenient Place; and although they are double gilded, the Silver will appear.

The counterfeit Milled is waſhed over or plated; and to diſcover this, you will find the Letters imperfect, or perhaps none upon the edges of Crowns or half Crowns; the ſound likewiſe will be flat and dull, and the Metal on the outſide may be eaſily raiſed to diſcover the defect.

As for old moneys, the worſt ſize is the half Crowns with pieces of Copper plated over; and theſe you may know by their riſing in the middle falling hollow, Mackle in the ſtamp, or better by

raising the thin Plate on the edge, and as for ſmaller money moſtly mixed with Silver, your touch ſtone is the beſt tryer.

CHAP. IV.

Inſtructions for making black, red, white, green Inks, &c. for ſundry uſes as well ſolid as liquid, with that of the late Invention in Powder; Directions for myſterious writing, and other things, &c.

To make the beſt common or black Ink.

TAke a Gallon of Rain-water or clear Spring or running water, and put twelve ounces of Nut galls bruiſed, or broken into it, and of Gum-arabick and Copperas of each two ounces, ſuffer it with once a day ſtirring to ſtand for the ſpace of twelve days in a warm place; and ſo uſe it as you have occaſion: And in this manner you may make a greater or leſſer quantity; but if you want Ink of this kind for preſent occaſion, you may boil your Ingredients in Vinegar and Water; but the Ink will not prove as the former.

To make red Ink.

Take the Powder of Braziel an ounce, white Lead and Alum of each two drams, Gum arabick a dram, put these into a pint of Urine, and stopped close in a bottle, and often shake them together, and the business will be effected.

Another way for red Ink.

Take of Gum-arabick half an ounce, Vermilion an ounce and a half, Lake a quarter of an ounce, and Vinegar indifferent strong a quart, mix them well together over a gentle Fire, and then suffer them to stand a while, shaking the Vessel when you come to use it.

To make white Ink to write on Black Paper or the like: As in case of Consolatory Letters to those whose Friends are deceased.

Take an ounce of chalk, as much Quick-lime, and a quarter of an ounce of Egg-shell with half an ounce of burnt Ising-glass, grind them well together, and put them into Gum water of any kind to a thickness of writing, and the Ink by Candle-light especially will appear like Silver.

To make Ink for the conveniency of Carriage in Powder, &c.

Take Lamp-black half an ounce, the Powder of Galls an ounce, Vitriol or Copper, as half an ounce, Gum-arabick a quarter of an ounce, Ivory black a quarter of an ounce make them into balls with water, adding if they ſtick not well together more Gum; and when you have occaſion to uſe it, ſcrape a little into a ſmall quantity of Wine, Water and Vinegar, and ſtir it about, and it will be exceeding black Ink immediately; and ſo you may be always provided with it without fear of ſpilling, or want of it in places of travelling, where there is none to be had, and inſtead of Lamp-black, you may uſe burnt Cherry-ſtones ground to Powder.

To make a red Ink to carry to any Place as the former.

Take the Powder of Braziel finely ground or beaten one ounce, mix with it the juice of Mulberries or Black-berries, or for want of them, water, wherein a little Lake has been diſſolved, add Gum-arabick half an ounce, to two ounces of the Powder, wet them to a thickneſs, and making them up in Balls, uſe them as the former.

To make green Ink.

Take the filing of Copper an ounce, Verditer half an ounce, Gum arabick half an ounce, and Vinegar half a pint, put them together in a ſtove or warm Oven, and ſuffer them to ſtand three or four days; then ſtir them together, and uſe the liquid part.

To make Ink that will make an Impreſſion, as that of Printers, &c.

Take of Lamp black an ounce, or for want of it Shooe-makers black, half an ounce of Vitriol, an ounce of fine ground Char-coal; to theſe add a quart of Line-ſeed Oil, boil them up with ſtirring over a gentle Fire, till they become of a ſufficient thickneſs; then take out the ſubſtance, and move it upon a ſtone or on an Ink-block with your Muller, till it is very fine; and ſo it will take the Impreſſion as of Letters, &c. in the nature of Prints or Pictures, &c.

Red Ink of the foregoing kind,

Is made with Vermilion and Line-ſeed Oil well tempered upon a ſtone with a Muller.

To write Letters inviſible but by Fire.

You muſt take the Juice of Limon and Onion, te mper

temper them well together, and let your Paper be very dry; then write what you think convenient, and send it to the Party you design, who knowing the Mystery before-hand shall no sooner hold it to the Fire, but those Letters which were blank before will fairly appear.

To make Letters appear by water.

Take well dried Paper, and having dissolved a quantity of Alum in Gum-water, write thereon, and suffering the writing to dry, dip the whole Paper under water, and the Letters will appear so much whiter than the rest, that they may be plainly distinguished and read.

To make Letters that cannot be seen or read, but by reading them through the Paper, &c.

Take white Lead finely ground with very weak Gum-water, and with it as thin as the temperature of Ink, write upon exceeding white Paper, not very thick; and by that means when it is dry, it cannot be discerned from the Paper, but by looking at a light placed on the other side of the Paper; and then the Letters will plainly appear by denying your Eyes to penetrate them, though the Paper be transparent.

CHAP.

CHAP. V.

Directions for cleanſing, colouring Gloves, and perfuming them; the way to ſcour Ribbands without much impairing the Colour; the Method of waſhing, ſtarching, &c. Silks, as Lute-ſtring, Lawns, Tiffanies, Sarcenets, &c. with other matters of Curioſity.

Foul Gloves to cleanſe without wetting.

TAke your Gloves, and lay them upon a clean board, and make a mixture of Fulling-earth and Powder of Alum very dry, and paſs them over on every ſide with an indifferent ſtiff bruſh; then ſweep of that and ſprinkle them with dried bran and whiting a conſiderable time; and ſo duſt them well, the which if they be not extraordinary greaſie, will render them clean as at firſt; but if they be greaſy, you muſt take out the greaſe with crumbs of toaſted bread, and powder of burnt bone; then paſs them over with a woollen cloth dipp'd in Fulling-earth or Alum powder; and ſo you may cleanſe them without wetting; which many times ſhrinks and ſpoils them.

To colour Gloves.

Take your Colours ſuitable to your intention, if dark take Spaniſh brown and black Earth, if lighter, yellow Oker and whiting, and ſo of the reſt; mix them with a moderate ſize, and daub the Gloves over with the Colour wet, and ſo ſuffer them to hang, till they dry by degrees; then beat out the ſuperfluity of the Colour, and ſmooth them over with a ſtretching or ſleeking ſtick, reducing them to their proper ſhape.

To make an excellent Perfume for Gloves.

Take Amber-greaſe a dram, Civet the like quantity, Orange flower-Butter a quarter of an ounce; and with theſe well mixed and ordered, daub them over gently with fine Cotton-wool, and ſo preſs the Perfume into them.

Another good Perfume on the like Occaſion.

Take of Damask or Roſe-ſcent half an ounce, the Spirit of Cloves and Mace of each a dram, Frankincenſe a quarter of an ounce, mix them together, and lay them in Papers between your Gloves, and being hard preſſed, the Gloves will take the ſcent in twenty four hours, and hardly loſe it afterward.

To cleanse caſt Ribbands, &c.

Take your Ribbands and ſmooth them out, having ſprinkled them a little before with fair water; then lay them on a Carpet or clean Cloth at full breadth, and having made a thin Ladder of Caſteel ſoap, go over them gently with a bruſh or fine woollen Cloth; then having in readineſs water, wherein a little Alum, and white Tartar has been diſſolved, go over them, till you ſee them clean; and ſo they will not only be clean, but the Colour will be fixed from further fading, if you ſuffer them to dry in the ſhade, and then ſmooth them out with a Glaſs Sleek-ſtone.

To waſh black and white Sarcenet the beſt and ſureſt way.

Lay theſe ſmooth and even upon a Board or Carpet, ſpreading a little Soap over the dirty places; make a Ladder then with Caſteel Soap, and having an indifferent fine bruſh, dip it therein, and paſs over the Silks the right way, *viz.* long-ways, and repeat your ſo doing till you perceive that ſide is ſufficiently ſcowred, and then turn the other, and uſe it in the ſame manner; whereupon take it up, and put it into fair water ſcalding hot, ſuffering them to lie, till ſuch time as you have prepared cold water, wherein a ſmall quantity of Gum-arabick has been diſſol-

ved

ved, as also, if for white Sarcinet, Smalt, into which you must put them and rinse them well, that done, take them out and fold them, clapping or pressing out the water with your hands on a Carpet that is dry, keeping them under your hands in the like manner, till you find them indifferent dry; at what time in case of the white, you must have Brimstone ready to smoak or dry it over, till it is ready for smoothing, which must be done on the right side with a moderate hot Iron.

To wash and Starch Tiffanies, &c.

In this case, the hems of your Tiffanies must in the first undertaking be only soaped a little; as also the Lace if any be on them; then having a Ladder of Soap, put them into it hot, and gently move them with squeezing them only, and not too roughly rubbing them, lest they break or crumple over much; and when you find they are pretty clean, rinse them in warm water, in which a little Gum arabick has been dissolved, keeping them as much from the Air as possible; this done, make Starch of a reasonable thickness, blewing it as you think convenient, adding a little lump of Alum to be dissolved therein; and when it is boiled to a convenient thickness, strain it, and during its being hot, wet your Tiffanies therewith gently, doing it with a soft Linen rag, and fold them up in a clean Linen cloth, pressing them therein, till they are somewhat dry, after which

which, clap them between your hands near a good fire; and so finish the drying them over Brimstone, and shape them to your purpose, and either sleek them over, or gently Iron them.

Lawns may in the manner of the former be ordered; Only observe to Iron them on the wrong side, and using Gum arabick water instead of Starch; and according to what has been directed for black Sareenet any coloured Silks may be ordered, abating, or augmenting as you think fit, according to the stiffness or limberness intended, your Gum-water.

To wash and starch Point-Lace.

Have a Tent prepared, fix the Lace in it, and draw it pretty streight; then having a Ladder of Casteel soap pretty warm, and with a fine brush dipped therein, rub over your point gently; and when you perceive it clean on the one side, do the like on the other, then cast fair water, in which a little Alum has been dissolved to take off the Suds; at what time having very thin Starch, go over with the same on the wrong side, and on the same side Iron it when dry; and so with a Bodkin open it, and set it in order.

To clean Point Lace, if not over dirty without washing, fix it in a Tent as the former, and go over with fine Bread, the Crust being pared off, and when it is done, dust out the Crumbs, &c.

CHAP.

CHAP. VI.

Instructions for ordering and framing curious Wax-work, Imbossing in Silver, or other Metals, making Flowers of Silk, carving and casting Imagery in sundry Figures, the Art of polishing, &c.

Wax-work its Nature, and how to be managed and performed.

IN this case you must provide your self with the finest Virgin Wax, rarefie it by often melting over a fire, till it become exceeding pliable, and render it the better, so put in a quantity of clarified Turpentine; and having considered your Figure, you must work it in water a little Warm, and move it into a curious flatness, then imboss it in Moulds, or as some will have you, cast it, especially where a curious resemblance of a Head or Face is required, working the rest of the Body proportionably upon sticks or wiers, ruffling as you see convenient the Garments, or pleating them; then having your suitable Colours, paint each part as the property with Water Colours prepared according to what has been directed in painting or limning with those Colours, and with a small Ivory Polisher go gently over those parts you would have to shine; and

then

then having prepared Glasses to cover them, which will give them the greater Luster, place them where you please for Ornament.

As for Birds, Beasts, Trees, Fruits and the like, they must be tempered after their former manner, and reduced in their sundry shapes, not forgetting every one to have its proper and natural Colour; and for the adornment of any Landskip, represent of this kind the Ground, where Grass is required may be Moss, which may in like manner serve for shrubs: But in case of the Leaves of green Trees, they may be Paper or Horn, thin and finely coloured, shaped and twisted upon wiers, in order as you shall see convenient: But as to every particular of this kind, 'tis only practice can perfect you.

To imboss Plate as Pewter, Silver, or other Metal.

Having your device drawn upon the piece you intend to imboss, you must lay the right side upon a Bed of Bees-wax covered over with a fine Cloth; and so proceed to punch out the Metal with punchers or tools for that purpose, going over every stroak and Line as in case of etching or graving; which done, you must turn the right side, and fill the imbossments with wax, that the hollows may bed close and not sink; then with your fine Tools and Graver polish and work the shapes in their due order by correcting and amending the roughness made by the punching out,

and

and giving fine touches and ſtroaks where you ſee it needful, and the Figures will appear very pleaſant, being a Performance of great Antiquity.

To work Flowers, &c. in Silk or Silver.

Take raw or fleaſy Silk of ſundry Colours comb out the droſs or ravel, laying each Colour by it ſelf; then twiſt and mingle the Colours by placing upon wires, according to the natural form of the flower intended; then comb them out, and faſhion them more exactly with your ſciſſors and Needle; then dip them in Gum-water, and by drawing them through it, and whilſt wet, open and ſhape them with your Fingers; that done, ſet them to drying in the ſhade; and in that form they will remain very pleaſant and delightful: And thus you may perform them ſingle, or on Branches with the ſtalks ſuitable, &c. You may in this manner form Fruits, and other things very material.

Carving of Images, &c. what is to be materially obſerved therein.

Reſolving to carve any curious Figure, you muſt provide your ſelf with a ſmall model or likeneſs either in Stone or Pot-traiture, whether it be for Wood, Ivory, or any thing elſe that is of that nature; and before you proceed to your rough carving with a black or red lead Pencil, or piece

of

of Coal draw as well as may be the true Proportion, Posture and Features, having before reduced the Wood or Stone to some set form; then cut them out as you see it convenient, or let them swell as curiously as may; then with smaller Tools proceed to polish them yet finer; and so working by degrees, till you have brought your matter to a proportion; and then remains the Curiosity of fashioning to the Life, and in this you must be curious in eying your Copy, beginning with the head or upper part; and so descend by degrees, running it over three or four times before you come, either to washing or polishing, that no unseemly knob or other deformity may appear, &c. And in case any Statue or Image, either cast or carved, require to be painted in lively Colours, the rule for painting in Oil ought as well in the mixtures as laying on, to be observed.

In casting of Images or Figures, the curiosity lies in forming the Mould, and bringing the stuff to a fineness, which if done in beaten Chalk, Terrace, Plaister of Paris or the like, they must be mixed with Gum-water, the better to strengthen them, but in case of Lime, &c. it needs not; and then no more is required than bringing the stuff to a fit temper or stiffness of dough; and the Mould being to clasp in the middle, and take asunder, fill it with the Material, and squeeze it hard in a Vice, having rubbed the out-side of the Mould before with dry whiting or chalk finely beaten, to prevent the sticking; then take it out,

and

and ſet it to dry in a place where there is a ſtove; and when it is thoroughly dry, you may glaze or colour it at Pleaſure.

If you deſign any Figure in Metal, and will not be at the trouble of imboſſing it in the expanſe; and ſo ſoldering it together, thereby rendering it hollow as in fine Metals 'tis often done; then muſt you make your Mould of Brick, Chalk, fine Clay, or the like; and place it, when dry and firm in a Bed of Sand, or in the Ground, keeping it cloſe together; have then your Metal rarefied or purged from droſs by well refining, and a trough or ſpout layed from the Plug of your Melter; and when the Metal is melted and skimmed, ſuffer it all at once to run with what ſpeed it may into the Mould, that every part taking hold of each other whilſt liquid, the whole Maſs may the better incorporate and render the thing deſigned without flaw or ſcaling; ſuffer it then to be thoroughly cold before you take it out; which done, poliſh it by taking off the rough outſide, and proceed with your tools to rectifie what is unſeemly.

To poliſh Marble or any curious Stone.

Take fine Sand, and the Powder of Alabaſter, poliſh it with a Poliſher; and then ſuffer it to be laid over for a time with Oil; after that calcine, or burn Egg-ſhells, and with the calcination thereof, rub off the Oil and poliſh it, and it will be of a laſting gloſs, &c.

To

To make any Writing on Parchment or fum Paper, decay and become unlegible in a ſhort time.

Take Quick-lime, and mix with it the white of an Egg, and rub over with the ſaid mixture the Parchment or Paper, when you intend to write; and although the writing for a time will ſeem fair, it will in a ſhort time decay, and look ſo faint, that it can by no means be read.

To make new writing look old, and of a long ſtanding.

Take a dram of Saffron, and infuſe it into half a pint of Ink, and ſuffer it to warm over a gentle fire, and it will cauſe whatever is written with it to turn yellowiſh and appear as if of many years ſtanding.

To make a curious Purple Ink.

Take a quarter of an ounce of Lake and half an ounce of Indico, and bruiſe them ſmall; which done, warm half a pint of water, and infuſe into it an ounce of Gum-arabick; then put the Colour in, and ſhake them well toge-

Take Blots, or Letters out of Paper or Parchment.

Take an ounce of Alum, dissolve it in a quarter of a pint of water over a gentle Fire, and drop a drop of it warm as you see occasion upon the Spot, and suffering it to lie for a time, take it up again with clean Cotton Wool on which you have breached to moisten it, and the business is in once or twice doing will be effected.

To render Writing very fair.

Take Gum-sandrick, bruise and sift it very fine, dip into it Cotton-Wool, and gently rub therewith your Paper or Parchment, and this is called the pouncing it, and is often used by School-Masters to set of their Copies to advantage.

To write Letters like Gold without the help of Gold.

Take of Vermilion half an ounce, Gum-armoniack the like quantity, bruise and mix them with the whites of a couple of Eggs, and temper them in water to a thinness, that you may write therewith; and then your writing being dry, glaze it over with a Polisher.

To write Letters that will appear like Silver, without any Silver.

Take of Block-tin, Quick-silver, and the whites of Eggs, each an ounce, melt the two former, and having ground them fine and small, put them to the latter, and mix them with Gum-water to the thinness of Ink; and so proceed to write, polishing your writing, when dry.

How to prepare your Shell-Gold, and write with it.

Take the ragged cuttings of Leaf Gold, grind them upon a curious smooth and clean stone with Gum-water, and a little Alum Powder; and when they are well incorporated, drop of the substance into small shells; and when you use it, temper a little fair water to bring it to a thinness; and having written with it your Pleasure, suffer it to dry; and then polish the writing, &c.

To make a good red Sealing wax.

Take of Bees-wax a pound, fine Turpentine three ounces, red Lead, or Vermilion finely ground an ounce and a half, Olive Oil an ounce, melt well the Wax and Turpentine, adding an ounce of Rosin fine in Powder; and when they are well melted, and the dross taken off, put in the Lead or Vermilion, and stir them well toge-

her, till they are well incorporated; and so make them into what form you please for your use.

To make black Wax.

Take of Lamp-black or black Earth an ounce and a half, Turpentine and Rosin of each four ounces, of Bees-wax a pound, incorporate them as the former with Oil.

To make green wax.

Take Verdegrease an ounce, and all the other Ingredients, except the colouring as the former, ordering it in the like manner.

To make golden or transparent Wax.

Take clarified Rosin four ounces, Turpentine two ounces, Bees-wax four ounces, Olive Oil two ounces, melt them well together; and scatter in the melting disordered or shattered Leaf Gold, and suffer it to mix and incorporate; then polish it over, when made into form, and the Gold will appear in the transparency.

Sealing Wafers to make them.

Take fine Flour sifted or boulted, that the bran remain therein, mix with it the Glare of Eggs, a quantity of Ising-glass so called, and

a little Yeſt, mingle the materials, beat them well together, ſpread the batter, being made thin with Gum-water on even Tin Plates, and dryed in a Stove, cut them out for your uſe.

CHAP. VII.

Artificial Vinegar, how to make it; Fire in Chimneys, how ſuddenly to extinguiſh it, blowing up Ships under Water, blowing up Houſes, and weighing of Veſſels that are ſunk, how to effect them, with Directions for Dyalling and Gauging, &c.

A way always to be provided with Vinegar for Sauce wherever you travel.

TAke the blades of green Corn, when young, beat them exceeding ſmall in a wooden Veſſel; then ſtrain out the juice, and take the remaining ſubſtance, and ſteep it in ſtrong White wine-vinegar, or the juice of Limons, and ſuffer it gently to warm over the Fire; and ſo let it ſtand in a warm place, till the Vinegar be conſumed; and then make the matter up into balls, and put them into a box and dry them;

and ſo coming into any place where Vinegar is not to be had, ſcrape a little of the Powder into a little water, and it will afford you, when heat over the Fire, or ſtirred well together, a very good Sauce.

In caſe of the firing of a Chimney, the means whereby it may preſently be extinguiſhed.

Take an ounce of Gun Powder, and a quarter of an ounce of Brimſtone fine beaten, wet them with water, and make wild fire thereof, and throw it in ſmall pieces into a ſmall pan of Char-coal or Coal fire, that the ſmoak may go directly up the Chimney, and it will cauſe the Soot the Fire has taken inſtantly to fall by parcels, till there be none left.

To break, or blow up a Ship or Veſſel that is ſunk, though lying ſome Fathoms under Water.

To do this, you muſt find how the Veſſel lies; and if you can conveniently let down a Barrel, or more of Powder in a ſtench Cask with a Cane or Leather Pipe let into it, and pitched round, ſo that it may, when the Barrel is ſunk to the loweſt, appear with the uppermoſt part above water; then having a Boat ready, and a red hot bolt of Iron with a pair of long Pincers, drop it into the Cane or Spout, ſo that it may fall into the Powder; at what time, make off as faſt as may be, and you will perceive immediately

ly a trembling of the water, and after that a Smoak to burst out; at what time, Planks, Goods, or any thing capable of floating will rise, the Vessel being broke by the force of the Powder.

To weigh any Vessel that is sunk the best way.

Lash a couple of Vessels together, and grapple the Vessel sunk, fastning the grapples, a Pole lying a-cross the two Vessels, the said Vessels being filled and low sunk by their weight, then empty them that they may rise, and they will cause the sunk Vessel to rise with them as far as they rise; then tow them as near to the shore as you can at high water, and at low water the sunk Vessel will appear above it, and you may empty it at your pleasure. And in this case twenty Tun of Vessels, Floats or empty Casks above water will raise a hundred Tuns under water.

To blow up Houses to prevent the Progress of a Fire the best and safest way.

If so it happen the House be Timber, and you would throw it off from the fire, place your Barrel of Powder under the main Girder on the contrary side you intend to turn it, and over it a Beam or piece of Timber, and fix in that another upright to touch the Barrel, on either side lay a train upon boards, covering it with Cloth to prevent its

taking Fire before you intend it; and then having a piece of Match fastened upon a Lin-stock, give Fire to your Wild-fire at the end of the Train, and so retire.

If you would take a Timber or Brick-house upright, place the Powder in the Cellar under the main beam in the manner aforesaid, just in the middle; or if there be no Cellar, bed it about as much as may be, and it will take it directly up from the Foundation; and then suffering it to fall directly down, it will break in pieces; at what time the Timber may be drawn away to prevent the Fires over-running it; and so by that means creep to the next building, and render your undertaking fruitless.

To make a Sun-dyal upon the Ceeling of a Room, and convey the beams of the Sun to it.

Prepare the Ceeling exactly level by raising it with fresh Plaster, if there be any defect; draw your Dyal according to the form of a horizontal Dyal, making the Lines and distance of equal Frame, set up your Gnomen or shadower, so that you may move it and leave blanks for the Figures; this done, conveniently place a Looking-glass, or burnished piece of Iron or Steel, so that it may reflect the light of the Sun upon the Dyal intended; then make it by another Dyal, how the Light moves, which it will do with the Sun; and according to that, being a true one, place your Figures; then take off the Gnomen

Gnomen or ſhadower, and lay it aſide, fixing the Glaſs or burniſhed Steel, that it may remain unſubject to be removed or ſhaken; and you may at any time without ſtirring out of the room, know whilſt the Sun is upon the Dyal what it is a-Clock.

To make a Dyal in the Glaſs of any Window, that has the benefit of the Sun.

Take a curious, ſquare, ſmooth Pane or Quarrey of Glaſs, fix it even with ſtrong Borders of Lead in the Window, and ſet up the Gnomen, ſiding, ſlaunting, or direct, according as the Sun has power upon it: Then by a Watch-Clock or other true Dyal, mark how the ſhadow moves to the time of the day with the point of a Diamond, and accordingly draw the Lines from the Center, and frame the Figures in due proportion and diſtance.

Directions to Meaſure or Gauge any Round Cask or Veſſel, &c.

In the firſt place multiply the half of the thickneſs in inches, by half the circumference, and that product by the length in the inches; the laſt product for Ale divide by 288, and the quotient ſhews the number of Gallons in the Barrel; and to bring theſe Gallons into Barrels, divide the quotient by 36, for ſo many in caſe of Beer a Barrel contains. But in caſe the Veſſel very much

bellies in the middle, measure but half of it to the Bung, and work as before; and adding the products together, you will have the true account.

CHAP. VIII.

Another Treatise of making sundry Inks.

To make a Powder upon which you may write with Water, &c.

BRuise to Powder a handful of Galls, half an ounce of Vitriol, and the like quantity of Gum-Arabick, and Gum-Sandrick; mingle them finely sifted together, and when you have occasion to write, rub over your Paper with a little of it laid upon Cotton-Wool; and then having sufficiently smoothed it, take water and write upon the said Paper; when suffering it to dry, it will take a black impression, occasioned by the Powder, as if it had been written with Ink.

Another curious Powder Ink, fit for Travellers, &c. or the London *Powder-ink.*

Take ten ounces of Nut-Galls, bruise them well, three ounces of *Roman* Vitriol, Gum-Arabick

bick and Roch-Alum, of each an ounce, make them into fine powder, ſift and dry them, at which time put the Powder up in cloſe Boxes or Papers, and when you have occaſion to uſe it, put a little quantity into a good quantity of water, and ſhake it well about, and it will inſtantly change the colour of the water, and at length become good Ink; that is, in leſs than two hours ſpace; by which means any perſon without giving himſelf conſiderable trouble of carriage, may be furniſhed at all times.

Another curious Powder of the like efficacy, how to make, and lately known by the white Powder-Ink ſo much coveted of late, &c.

Take Gum-Sandick two ounces, beat it well to Powder, and ſift it through a fine ſieve, and as much of *Chalcantho*, ſo called by the *Latins*, of which you may furniſh your ſelf at the Druggiſts; mix them well beaten and pulverized, and a quarter of an ounce of this, or little more, will turn a pint of Water or Vinegar, into a curious writing Ink in a very ſhort time.

Mathiolus's *Direction for making a curious and laſting Ink,* &c.

Take five ounces of Galls well bruiſed, *Roman* Vitriol three ounces, Gum-Arabick two ounces, Bay-ſalt a drachm, or inſtead of it a quantity of

Alum

Alum; mix them well together in a new glaz'd earthen pot, and pour upon the mixture White-wine, very ſtrong and hot, about five pints, and ſuffer it, the weather being hot, to ſtand in the Sun for the ſpace of fifteen days; or it may be done in a ſtove Oven, or in the Chimney-corner, frequently ſtirring it about; and ſo pouring out the droſs, an excellent Ink will be had, not ſubject to change by time, nor alter its colour.

Two excellent ways of ſpeedily making Ink, &c.

1. Take Vitriol and Gum-Arabick of each an ounce, of Galls well broken a like quantity, of ſharp Wine or Wine-Vinegar ten ounces, and ſuffer them to ſtand together for an hour, ſometimes ſhaking them, they will turn the liquid part exceeding black, and render it fit for your uſe.

2. Take of Galls half an ounce well bruiſed, mingle with it a like quantity of Gum-Arabick, and of *Roman* Vitriol eight drachms; put theſe into eight ounces of White-wine pretty hot, and in as ſhort a time as the former, a perfect Ink will be made.

How to make a Black that will not only ſerve for Ingroſſing, but Painting, &c.

Take Copperas half an ounce, bruiſed Galls an ounce, Lamp-black an ounce, Gum-Arabick half an ounce mix them with a pint of Wine or Vinegar,

gar, ſet them over a gentle fire, and ſuffer them to ſimper till a half part be conſumed; and what remains will render an excellent thick and black Ink.

The famous George Machijus's *Receipt for curious Writing-Ink, &c.*

Take of Galls three ounces, *Roman* Vitriol two ounces, Gum-Arabick half an ounce, and having well bruiſed them, infuſe the Galls in two quarts of White-wine, for the ſpace of eight days, ſtirring them well about each day; and three days after the putting in the Galls, put the Gum in, diſſolved in a little Wine by it ſelf, before it be put in, three days after the Galls and the Vitriol, as long after that, ſtirring them at ſundry times; and at the termination of eight days, the Ink will come to a full and curious perfection.

To make a kind of Ink to write obſcurely, and not to be read, unleſs the Paper whereon the Writing is, be held to the Fire.

Take that which is vulgarly called Sal-Armoniack, and Nitre, of each half an ounce, mingle them with the Juice of Limon over a gentle fire; and having refined the liquid part from the droſs, uſe it when cold; and ſo holding the Paper when it is written on to the fire, the Letters will fairly appear, or otherwiſe it will not, *&c.*

To take away spots or defects out of Writing, either on Paper or Parchment.

Take Roch-Alum burnt half an ounce, as much of the Flour of Brimstone; and being finely in Powder, wet the Paper a little, and put a small quantity of the Powder upon the place, rubbing it gently with your finger, and the Maculation will disappear. And thus much for the Treating of Inks, &c. wonderful necessary and useful on all occasions, and profitable to those that will undertake to make them for Sale.

CHAP.

CHAP. IX.

The Art of making Waſhes, and other Beautifying Materials, for taking away Sunburn, Morphew, Freckles, Roughneſs of the Skin, and reſtoring a curious Complexion; as alſo Whitening the Teeth, Enlivening the Eyes, Curling and Colouring the Hair, &c.

A Water to reſtore a faded Complexion.

TAke the Flowers of Roſemary, Comfrey, and Cammomile, boil them in White-wine, and waſh your face and hands therewith morning and evening.

To create a very fair Complexion.

Take two ounces of white Tartar, burn or calcine it, then quench it in the deſtilled Water of Roſes, and waſh the face with it.

To render a freſh and comely Complexion.

Take an ounce of the Oyl of Sweet Almonds, the like quantity of the Oyl of Myrrh, bruiſe in them of the Powder of Gum-Sandrick a grain, and with

with the whole mixture, rub and anoint the face.

To render the Skin clear, and of a very fair Complexion.

Take Bean bloſſoms, and the Water that deſtills from the Vine, with the Flowers of Fumitory, diſtill them, and make a Waſh with what proceeds there-from.

To make the Skin ſmooth and ſhining.

Take of the Marrow of Swines-feet an ounce, Oyl of Nutmegs a quarter of an ounce, Dears ſuet half an ounce, Oyl of Bay berries two ounces, make them into an Oyntment over a gentle fire, and anoint the face, hands, or any part of the body therewith.

To remove Freckles, Tan, or Sun-burn.

Take the Juice of Burdock leaves and Limons, of each a like quantity, mix them together, and add half as much Oyl of Chammomile, a little Rye-meal, and the Gall of a Cock or Capon, make them into an Ointment, and anoint the place therewith, and in a ſhort time the defect will be removed.

To

To remove Pimples or Redneſs.

Take an Egg and roaſt it hard, then take out the Yolk at the top, and fill it with Copperas, and put it cloſe covered in the Embers, till the Copperas is melted or become water; then pour out the water and bath the face with it; but if it be too ſharp, you may allay it with the water or juice of Celandine; and in often uſing it, your Expectations will be anſwered.

To remove the Redneſs in a face, &c. occaſioned by Scalding, Blaſting, &c.

Take a handful of the Bark of Elder, as much Rue and the roots of Scabeous, with an ounce of the Flowers of Chammomile; bruiſe them together, and boyl them in a pint of Milk, half a pint of Olive-Oyl, and adding a quarter of a pint of Verjuice, till the liquid part become thick as an Oyntment, and then ſtrein it out; which being cooled, anoint the place therewith morning and evening.

To take away unſeemly Warts or Moles not too deep impreſſed.

Take Rhubarb a drachm, Camphora the like quantity, the Oyl of Petrolium half as much, and an ounce of the juice of Houſleek, bruiſe and beat theſe in a quarter of a pint of Vinegar over a gentle

gentle fire, and anoint the place or part therewith, and in often so doing, you will find your desire effected.

To make a swarthy Complexion fair and clear.

Take the Liver of a Goat, dry it to powder in a Stove or Oven, then steep the Powder in White-wine, adding a quarter of a pint of the Juice of Celandine, an ounce of Coriander-seeds, and as much of Fennel, decoct or boyl them over a gentle fire, and with the liquid part anoint or bathe the face, &c. and so continue to do often, and it will remove the cholerick humour occasioning swarthiness.

To brighten and enliven the Eyes.

Take Vervein, Pelitory of the Wall, Smadage, and Betony, with the Flowers of Eye-bright, destil them and wash the Eyes with the water morning and evening, and it will not only render them bright and clear, but give a true prospect and dimension to the decayed sight.

To

To make Bloom-water, an excellent Beautifier upon all occaſions.

Take the Bloſſoms of Peaches, Baum, Lavender, Cotton, and Roſemary, ſteep them in White-wine, and deſtil them, and the Water will prove an excellent Beautifier.

To make an excellent Pomatum *for the hands and face.*

Take Sheeps marrow an ounce, Oyl of Sweet Almonds the like quantity, the Juyce of Smalage a quarter of a pint, Bean flour half an ounce, make them up into an Oyntment, and anoint the hands and face warm therewith, and it will make them plump, ſoft, and free them from cracks, chops, or roughneſs.

An excellent Paſte for the Hands.

Take the Flour of ſweet Almonds an ounce, Rye-meal two ounces, white Starch an ounce, and Milk half a pint, with which make theſe before-mentioned into a Paſte, and that Paſte into Balls for your uſe.

To ſoften the Skin, and render it freſh, an Oyl, &c.

Take of the Oyl of Nutmegs an ounce, Ambergreaſe a drachm, Oyl of Chammomile an ounce, the Juice of Comfrey half a quarter of a pint, make them into an Oyl or Oyntment, over a gentle fire, and ſupple them into the Skin very hot, and in often ſo doing, it will wonderfully beautifie and cauſe an excellent flavour, *&c.*

An excellent way to ſweeten the Breath.

Take Sal Armoniack a drachm, beaten Ginger two drachms, the Spirit of Cloves a drachm, Coriander-ſeeds in fine powder a quarter of an ounce, Oyl of Maſtick a drachm, bruiſe them together, and make them up into a Ball, and each morning ſcrape about the quantity of a large pea into a glaſs of Wine or Beer, and drink it off.

To make Hair grow.

Take of the powder of Bithwort-roots a drachm, of the Juice of Fennel half an ounce, Ivy-berries dried and beaten into powder an ounce, the Juice of Houſleek half a quarter of a pint, and of White-wine a pint, boyl theſe over a gentle fire to a half conſumption of the liquid part,

part, and wash the place deficient, and in a short time if that part be subject to Hair, it will cause it to grow and increase.

To take away Hair.

Take the Juyce of Hellebore or Bears-foot half an ounce, as much of that of Burdock roots and the roots of Cuckowpintles, and anoint the place with it warm, and by often so doing, the Hair will fall off.

To make any coloured Hair black, or of a dark Colour.

Take burnt Ivory ground to powder a quarter of an ounce, Soulters Ink the like quantity, the Juyce of Hemlock a quarter of a pint, incorporate them over a gentle fire till the moisture be near consumed; then add Black lead powder to dry up the rest, and with this rub your Hair or powder it, and it will be a curious black, as likewise lasting, if before you wash your head with White-wine wherein Plantane-roots have been sod.

To make Hair Curl.

Take the Powder of Elecampane-roots well dryed, and as much of Alum in fine Powder, wet your Hair a little with water wherein Raisins have been steeped, and so sprinkle on the Powder with

a

a fine Sprinkler, that it may be all over, then with a pair of Curling-Irons somewhat hot, turn it up in ringlets under a Cap, &c. and so let it dry, as likewise continue for the space of a night, and next morning comb it out, and the Powder that remains will not only fly away, but the Hair will fall into curious Curls, and so continue without any further trouble for a very long time.

A way speedily to take away the Spots occasioned by the Small-Pox.

Take half an ounce of Copperas, and dissolve it in the Juyce of Limons, and anoint the Spots with it when warm, and their redness will soon disappear.

To prevent Pittings.

When the Distemper begins to appear, rub the face over gently with Honey, Oyl of Roses, and a little Alum dissolved and well mixed together over a moderate fire, and in so doing every other day, the pits will be prevented if the Party uses no violence to himself by scratching, &c.

To whiten Teeth.

Take a piece of fine Pumice-stone, grind it to powder, adding to that powder a little quantity of Alum-powder, and by often rubbing the Teeth with it, they will if sound be as white as Ivory.

CHAP,

CHAP. X.

Miscellany of rare and curious Secrets not yet touch't upon.

How to separate Gold and Silver from other Metals.

TAke Mercury and put it in a Melting or Refining-pot on the fire, adding some Varnish-Glass beaten to powder, and being finely mixed, lay it in powder upon the Metal that is gilded with Gold or Silver, and set some hot coals under it, and it will take off the gilding, and render the Metal as if it had never been gilt; and in this case you may save the Gold and Silver, if of value, by putting to it Quicksilver, which will attract it into a body.

To kill or allay Mercury or Quicksilver.

Put which of these you design in a Mortar of Iron or Brass, adding some Olive-Oyl, mix them together as well as may be over a gentle fire, adding more when it begins to bubble strong Wine-vinegar; and in so using the aforesaid Materials, they will become so hard as easily to endure the Hammer.

To

To boyl Gold and Silver in the way of Cleansing.

Take Tartar bruised to powder, put to it a considerable quantity of Spring-water, and so being boiled up over a quick fire, put in the Plate, and let it continue for a considerable time.

To soften Gold or Silver.

Take sublimate Mercury, Sal-Armoniack, of each a like quantity, and when the Metal of either sort is melted, put a small quantity of the powder into it, and so suffer it to operate thereon, if Gold put more; if Silver less.

To soften Bone or Ivory.

Take Bone or Ivory that is hollow, and take the Juyces of Alexand. Milfoyl, Radish roots, Hore-hound, and sharp Wine-vinegar, and fill the cavity; after which, lay it near a gentle fire, that the heat may infuse; and in suffering it so to do, in a little time it will mollifie the hard quality.

Experiments of other Natures, viz. How to keep Grapes fresh all the year.

Gather the Grapes in a fair day, when no wet or moisture is upon them, cleanse them from those that are any ways perished, and let

let them steep a while in white Muscadine a little warm; after which dry them and stop them up in new earthen bottles, setting them in a cool place free from the Sun or too much Air, and they keep without perishing.

To make Mellons, Cucumbers, or such-like Fruit ripen by Art.

Boil Wheat-bran in Water and a little fine Mould, and water the roots of the Plants with it morning and evening, setting them in hot beds, and covering them from cold and blasts with pots, glasses, &c.

To make Trees bear Fruits of any Colour.

Bore a hole in the body of the Tree, at such time as the Sap begins to rise, and plug it up close, and you will perceive what liquid Colour you put in, the same will tincture the Fruit, and give it a participation of its hue.

To kill or drive away Fleas or Bugs.

Take the Juyce of Rue and the Gall of an Ox, mix them together, and anoint the post and frame therewith, and strow in the Mat Powder of Southern-wood and Wormwood.

To make one that is very hoarse or speaks inwardly, have a very clear Voice.

Take the Flowers of Elder; dry them in the Sun, and so order it that without taking wet they may be beaten to powder; which done, keep the Powder in a glass, and when you would use it, put as much as will lie upon a six-pence, into a glass of Wine pretty warm, and drink it off.

To make Letters that will soon vanish.

Take Aqua-vitæ, dissolve a little Camphire in it, and put to them the Ashes of burnt Straw well mingled or tempered together, which for a time will produce a fair Writing, but at your pleasure you may wipe it off the Paper or Tablet, nor will it be long ere it decays of it self.

To renew Letters decayed.

Boil a few Galls in Wine, and wipe over the faint Letters with a Spunge dipped in the Juyce, and they will appear fresh and in full lustre as when written.

To renew the Marks in Knives that are in a manner worn.

Polish them well with Powder of Emeril and Oyl; after that, cleanse them with chalk to brightness, then wet the Blades in Lime Juyce and

and Tanners water made with Vitriol, and they will cauſe the marks to appear exact and fair, and this way you may damask them.

How to Grave a Porphory-Marble without an Iron tool.

Take a ſmall quantity of ſublimate Mercury, a like quantity of Sal-Armoniacum, with as much Verdigreaſe, deſtil them in a Retort of Glaſs, calcine a ſmall weight of Tin and Fire-ſtone, and ſome Sal-Gem, deſtilling them over three times in ſharp Vinegar, and ſo making a ground of Wax, Roſin, and Turpentine, lay it on the ſtone as in the caſe of Etching; and when you have drawn with an Iron point what you intend, pour on the water, and ſuffer it to continue till it has corroded the ſtone according to what you drew upon it.

How to make Water riſe by heat, &c.

Let there be a Veſſel above, either of Braſs, Clay, or Tin, and a pipe in the middle of it, that may deſcend into the Water below; ſo faſtned that it takes not Air; then let the Veſſel above be made hot, and it will by means of the Air's being rarefied by the heat attract the water to it.

CHAP. XI.

Another Miſcellany of rare and curious Experiments, uſeful, profitable, and altogether pleaſant, &c.

To cauſe Water (contrary to the nature thereof) to aſcend.

PRepare a Baſon with a pint of Water in it, or thereabouts, then take an earthen Pot or Jug with a round belly (fitted for this ſervice) and light a piece of Paper, caſt it into the Jug flaming, then turn quickly the mouth of the Jug downward, and ſet it on the midſt of the Baſon of water, it will ſuck up all the water, if it be not more than it can receive and contain within the belly thereof.

To carry a Jug or earthen Pot, ſticking without any thing, unto the palm of the hand.

Take a piece of Paper, ſet it on fire, and caſt it flaming into the mouth of the Jug, preſently clap the palm of your hand on the mouth of the ſaid Jug or Pot, not hollow, but plain and ſmooth; the Jug will not fall from your hand, but you may walk many paces, and carry the ſame ſticking unto the palm of your hand, unleſs by violence you pluck it away.

To

To break a Stick placed upon the brims of two Glaſſes, and not break the Glaſſes.

Place the Glaſſes on a ſmooth ſtone of an equal height, and put the ſtick upon them; then take a battoon or cudgel, and therewith ſtrike upon the midſt of the ſtick perpendicularly, or downright; ſo may you break the ſtick, and not hurt the Glaſſes.

To take the impreſſion of any Seal.

Melt a little Brimſtone, caſting in ſome Ceruſe or white Lead, put this mixture on the Seal, ſtrengthening it with a ſmall piece of Paper, a little bigger than the impreſſion is; being cold, take it off, and you will find the print of the Seal thereon.

How to write a Letter ſecretly, that cannot eaſily be diſcovered or ſuſpected.

1. Write your mind at large on one ſide of the Paper with common Ink, and on the other ſide with milk, that which you would have ſecret; and when you would make the ſame legible, hold that ſide which is written with Ink to the fire, and the milky Letters will ſhew blewiſh on the other ſide.

2. Rule two Papers of one bigneſs with lines of an equal diſtance, make the one full of Glaſs-windows, through which you muſt write your

mind upon the ſecond Paper, then fill up the ſpaces with other words at your pleaſure; but if all were made to hang together in good ſence, it would carry the leſs ſuſpicion. Each friend muſt have one of theſe cut Papers to read all ſuch Letters, for without the Paper it will trouble a good Decypherer to read the Letter.

Of the Dyal upon the Fingers and the Hand.

Is not a commodity very agreeable, when one is in the field, or in ſome Village, without any other Dyal, to ſee only by the hand what of the clock it is, which gives it very near, and may be practiſed by the left hand in this manner.

Take a ſtraw, or like thing, of the length of the Index, or the ſecond finger, hold this ſtraw very right between the thumb and the right finger, then ſtretch forth the hand, and turn your back and the palm of your hand towards the Sun, ſo that the ſhadow of the muſcle which is under the thumb touch the line of life, which is between the middle of the two other great lines, which is ſeen in the palm of the hand; this done, the end of the ſhadow will ſhew what of the clock it is; for at the end of the great finger it is 7 in the morning, or 5 in the evening; at the end of the ring-finger it is 8 in the morning, or 4 in the evening; at the end of the little finger, at the firſt joynt, it is 9 in the morning, or 3 in the afternoon; 10 and 2 at the ſecond joynt, 11 and 1 at the third joynt, and mid-day in the line following, which comes from the end of the In-

dex.

Hazu

How to make Water boil and ſparkle.

Take a glaſs near full of Water, or other liquor, and ſetting one hand upon the foot of it to hold it faſt, turn ſlightly one of the fingers of your other hand upon the brim or edge of the glaſs, having before privately wet your finger; and ſo paſſing ſoftly on with your finger in preſſing a little; for then firſt the glaſs will begin to make a noiſe: Secondly; the parts of the glaſs will ſenſibly appear to tremble, with notable rarification and condenſation: Thirdly, the Water will ſhake, ſeem to boil: Fourthly, it will caſt it ſelf out of the glaſs, and leap out by ſmall drops, with great aſtoniſhment to the ſtanders-by, if they be ignorant of the cauſe of it, which is only in the rarification of the parts of the glaſs, occaſioned by the motion and preſſure of the finger.

Of the Play at Nine-Pins.

You will ſcarce believe, that with one Bowl, and at one blow, playing freely, one may ſtrike down all the nine Pins at once; yet from Mathematical Principles it is eaſie to be demonſtrated, that if the hand of him that plays was ſo well aſſured by Experience, as Reaſon inducth one thereto, one might at one blow ſtrike down all the nine Pins, or at leaſt 7 or 8, or ſuch a number as one pleaſeth.

For

For they are but 9 in all, disposed or placed in a perfect square, having three every way: Let us suppose then that a good Player beginning to play at 1, somewhat low, should so strike it, that it should strike down the Pins 2 and 5, and these might in their violence strike down the Pins 3, 6, and 9, and the Bowl being in motion, may strike down the Pins 4 and 7, which 4 Pin may strike down Pin 8, and so all the nine Pins may be striken down at once.

Any Numbers under 10 *being thought upon, to find what Numbers they were.*

Let the first Number be doubled, and unto it added 5, and multiply that sum by 5, and add to it 10, and the next number thought upon: Multiply the same again by 10, and add to it the next number, and so proceed.

Now if the last sum be told, mark if one number was thought upon, then substract 35 from it, and the first figure in the place of Tens is the Number thought upon. If he thought upon two figures, then substract 35 also, and the 2 also, the said 35 from the last sum, and the 2 figures that remain, are the numbers thought upon. If he thought upon 3 figures, then substract 350, and then the 3 first figures are the numbers thought upon, &c.

Ex-

Example.

If one thought upon these figures, 5, 7, 9, 6.

Double the first, which is 5, and it makes 10, to which add 5, it makes 15; This 15 multiplied by 5, makes 75. To this 75 add 10, it makes 85. To this 85 add the next number, *viz.* 7, it makes 92. This 92 multiplied by 10, makes 920, to which add the next figure, *viz.* 9, it makes 929. This multiplied by 10, makes 9290. To which add 6, being the last number, it makes 9296. From which substract 3500, and there resteth 5796, the four numbers thought upon.

Now because in the figures 9296, the two last numbers are like the two thought upon; to avoid suspicion, bid him add 12, or any number to it, and then it will not be so open: As for example, the 12 being added to 9296, it makes 9308; from which if you substract 3512, there will remain 5796, the four figures thought upon, as before.

Two persons thinking two numbers, the one an even number, and the other an odd number, to divine and tell who thought the one, and who the other.

Bid the first Man to double his Thought, and the second Man to treble his, then to add both numbers together. Then bid the one of them

cast

caſt away half; which if he can do, the total is even, otherwiſe odd.

The Total being Even,
1 *Even.* The firſt Man thought odd,
The ſecond Man even.

The Total being odd;
2 *Odd.* The firſt Man thought even,
The ſecond Man thought odd.

Example.

1 *Man.*		2 *Man.*	
Thought	15		24
Doubled, is	30	Trebled, is	72
30 and 72 added together, is			102

The Total is even, becauſe half may be caſt away.

The total being even, the concluſion is, the firſt Man thought odd, and the ſecond Man thought even, *&c.*

1 *Man.*		2 *Man.*	
Thought	34	Thought	45
Doubled, is	68.	Trebled, is	135
Add 68, and the Total of both is			203

Caſt away half. Anſwer, I cannot.

The Total therefore is odd. The Total being odd, the Concluſion is, the firſt Man thought Even, the ſecond Man thought odd.

Four

Four Men thinking on four Digit numbers, (which are from 1 to 9) to tell what the first, second, third, and fourth Man thought.

This concluſion findeth out any number thought, under 10000.

Four perſons ſtanding in rank, admit the firſt think 8, the ſecond 7, the third 6, and the fourth 5.

Let the firſt Man double the number of his thought, and add 5 thereto, then multiply the whole by 5, and add 10 to the product, noting the Total.

Bid the ſecond Man demand of the firſt Man his total number, which being given him, let him add unto the ſame his Thought, and give the Total to the third Man.

Then bid the third Man to affix or ſet his Thought by the number given him, and put it one place towards the right hand; and give the total thereof to the fourth Man.

Laſt of all, bid the fourth Man ſet his Thought thereby, a place yet to the right hand, in the firſt place, and add the number of 25 unto it; that done, demand of him the total number, which being given you, ſubſtract out of it 3525 the number remaining will diſcover the four Mens Thoughts.

The Digit on the left hand ſheweth the firſt Mans Thought; the next Digit towards the right hand is for the ſecond Mans Thought; the figure in the ſecond place repreſenteth the third Mans Thought, and the figure in the firſt place giveth the fourth Mans Thought. *Ex-*

Example.

1. The first Mans Thought 8, which being doubled is 16, and 5 added thereto is 21, which multiplied by 5 is 105. Whereunto add 10, the whole is 115

2. Secondly, let the second Man add in 7 (his Thought) it stands thus, 122

3. Let the third Man set his Thought a place to the right hand thus, 122. 6

4. Let the fourth Man place his Thought a place yet to the right hand, thus: 1226. 5

Also bid him add in 25, and it maketh 12290

Demand the Total, it is 12290

Which being given you, deduct 3525

The remains will be 8765

Ans. The first Man thought 8, the second Man thought 7, the third Man thought 6, the fourth Man 5.

Example.

First Mans Thought 8

Doubled, is 16. and 5 added 21. Multiplied by 5, is 105, and 10 added in is 115

Second Mans Thought added in, is 7

The total is 122

Third and fourth Mans Thought set thereby, 1226. 5

Added, makes 12290

Subtract 3525

Particular Thought, 8. 7. 6. 5

Of the 4 Men, 1. 2. 3. 4

FINIS.

62, 64, 67, 71,

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